THE MILKEN INSTITUTE

Review

THIRD QUARTER 2001

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It's been a hard summer for rational economic men and women. After tantalizing us with the prospect of a tax cut that would allow us to keep an extra six cents from every marginal dollar earned, Washington delivered a $600 rebate that will have no effect on our incentives to work or save this year. Oh well, we shall soldier on... secure, at least, in the knowledge that if we commit suicide in 2010, our millions will pass tax-free to our heirs.

Meanwhile, in spite of the stultifying wedge between my earnings and take-home pay, I've put together a dandy issue whose present value far exceeds the opportunity cost of the time required to read it.

Tim Ferguson, the Los Angeles bureau chief of *Forbes* magazine, explains why Target proved too low rent for the People's Republic of Santa Monica. "Compared to most of California, an unusual number of city residents are transit dependent or auto defiant," he writes. "But Santa Monica would not secure an affordable retail base for them, if that meant antagonizing the local motorists. The first priority, it turns out, is traffic flow."

Michael Bernick, the director of California's Employment Development Department, bemoans the reality that it is far easier to create entry-level jobs than to help the unskilled work their way out of poverty. "While the policy literature is littered with seemingly sensible tracts on how to train people for better jobs, it hasn't had much practical impact," he writes. "And, for anyone working on the front lines of the anti-poverty war, this failure should be a red flag that serious obstacles exist to getting from here to there."

Josh Lerner, who teaches finance at the Harvard Business School, puts the spectacular rates of return on the Microsofts, Amgens and Ciscos of the investment world into perspective. The temptation to regulate away the profits of very high risk, very high return enterprises may be almost irresistible, he explains. However, "if even a small number of successful high-technology companies are not allowed to earn an attractive rate of return because of regulation after the fact, there may be a dramatic reduction in the willingness of investors to finance similar ventures in the future."

Ed Wolff, an economist at New York University, steps back for a look at what's happened to the distribution of wealth in America since the early 1980s. And his conclusions are, to say the least, unsettling. "The richest 1 percent received 53 percent of the total gain in marketable wealth over the 1983-98 period," he calculates. "The next 19 percent received another 39 percent. So that the top quintile accounted for 91 percent of the total growth in wealth, while the bottom 80 per-

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cent accounted for a mere 9 percent."

While we're on the subject of class warfare, **Bill Gale** and two of his colleagues at the Brookings Institution, has a thing or three to say about the Economic Growth and Tax Relief Reconciliation Act of 2001. That's right: President Bush's tax cut. "Although the plan was originally packaged as 'a tax cut with a purpose,'" writes Gale, "the purpose kept changing while the tax cut stayed the same. Remarkably, almost every event seemed to justify not only a tax cut in general, but a particular tax cut designed in November 1999 to fend off Steve Forbes's challenge for the presidential nomination."

Lou Guth, a senior vice president at National Economic Research Associates, and **Michael Shagan**, a consultant specializing in the gambling industries, wonder whether thoroughbred racing should be as heavily regulated as, say, the ownership of nuclear weapons. "There is a powerful case for eliminating many of the rules for how horse racing is organized – strictures that simply don't make sense in light of any modern rationale for economic regulation," they conclude.

Marsha Vande Berg, a consultant who publishes *The World Report* newsletter, offers a glimpse at the competition between China and India to become the leading low-cost producer of software. "India holds the lead," she explains, "facilitated by an early start, an education system that understands how private enterprise works, and a timely boost into the international big leagues as the leading provider of Y2K bug fixes." But the Chinese are not out of contention: "In the long term, they hope a thriving private IT sector can serve as a buffer to the economic dislocation that is inevitable in the wake of entry to the World Trade Organization."

This issue's book excerpt comes from *Damned Lies and Statistics* (University of California Press), by **Joel Best**. The author, a sociologist at the University of Delaware, is appalled by the innumeracy of the media and – equally important – their incentives to remain innumerate. "Advocates prefer dramatic statistics, numbers that make the problem seem as serious, the need as urgent, as possible," he explains. "If, through transformation or confusion or compound error, they devise a mutant statistic that happens to be more dramatic than some original figure,

there is a good chance the mutation will spread. Drama ensures repetition, while innumeracy discourages critical thinking."

Wait: No flipping. Institute economists **Glenn Yago** and **Tom Hall** introduce the Milken Institute-PriceWaterhouseCoopers Opacity Index, **Steve Postrel** of Southern Methodist University offers a new puzzler, Institute demographer **Bill Frey** charts the comings-and-goings (and lack thereof) of the Baby Boomers, and our cartoonist **Mark Alan Stamaty** takes another swipe at President Bush. — *Peter Passell*

KEN BURRIS

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BY WILLIAM H. FREY

The baby boom tsunami has been a prime fascination of demographers, marketers and social forecasters ever since this huge generation began flooding the nation's schools in the 1950s.

From Howdy Doody to Woodstock, from the ERA to IRAs, these 80 million Americans have redefined the lifestyles, politics and consumption patterns of each new life-cycle stage they entered. Now, fully situated in middle age, with high incomes and fat stock portfolios to ease their way, the boomers have become a serious economic as well as social force with which to be reckoned. And, as usual, all eyes are on them.

A new release of the 2000 Census, matching age trends with detailed geography, gives us a first glimpse of where the boomer tsunami will have its greatest impact. Since boomers and middle age are now synonymous, the whole country will become more middle-aged – but some places more than others.

BY THE NUMBERS

Fudging just a tad, the boomers can be considered the 20-year block, aged 35 to 54 on Census Day 2000. During the 1990s, the leading edge of boomers inflated the nation's 45-54 year-old age group by nearly half, displacing a smaller pre-boomer cohort. In fact, boomer growth dwarfs the 1990s gains or losses in all other age categories, and is responsible for the "middle-aging" of America.

WILLIAM FREY is a senior fellow in demography at the Milken Institute.

BRUCE SANDERS (ALL)

ADVANCED MIDDLE AGE

Boomers reside everywhere, but their impact is especially pronounced in regions not thought to be particularly mature. Las Vegas leads all large metros in its growth of the 35 to 54 year-old set – practically doubling its numbers during the 1990s. Not far behind are

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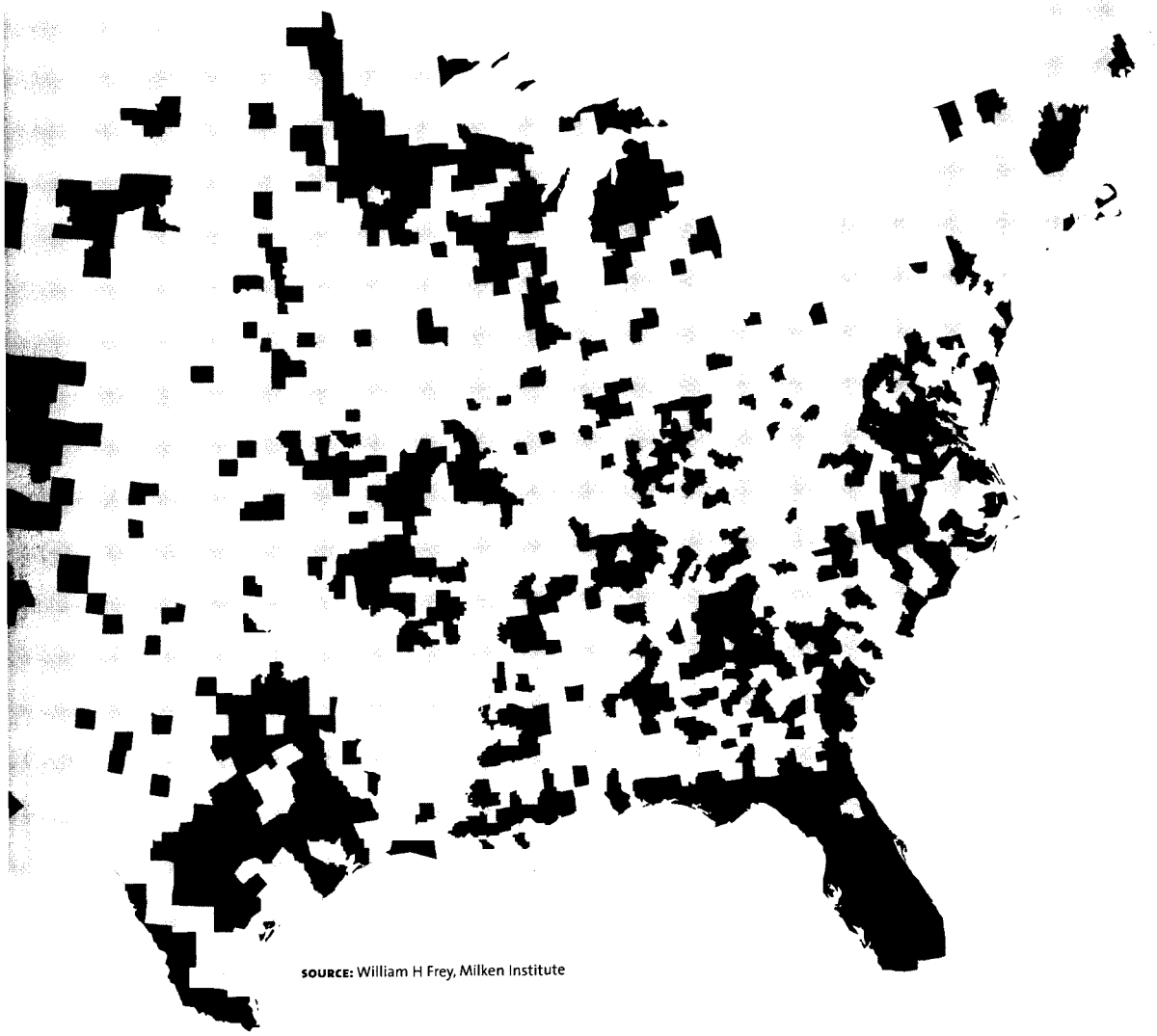
other parts of the West, known for attracting either the very old (Phoenix), or the young (Boise, Colorado Springs, Tucson, Denver). The same holds for the nation's other youthful region, the South. Boomer-induced middle-aging is especially pronounced in college towns like Austin, and in hot local economies that, in the past, mostly attracted the young and the restless (Orlando, Atlanta, Dallas, Nashville).

Why would boomers, long in the tooth, be moving to these hot spots now? The answer is that they are not, in fact, doing very much moving. Most of the middle-aging patterns reflect migration of boomers to these areas earlier in their careers; they are simply aging in place. This is good news for the affected areas, both demographically and economically. They attracted the cream of the boomer labor force crop while the boomers were still

MIDDLE-AGED BULGES

U.S. COUNTIES WITH POPULATION AGE 35-54 GROWING MORE THAN 35% FROM 1990-2000



SOURCE: William H Frey, Milken Institute

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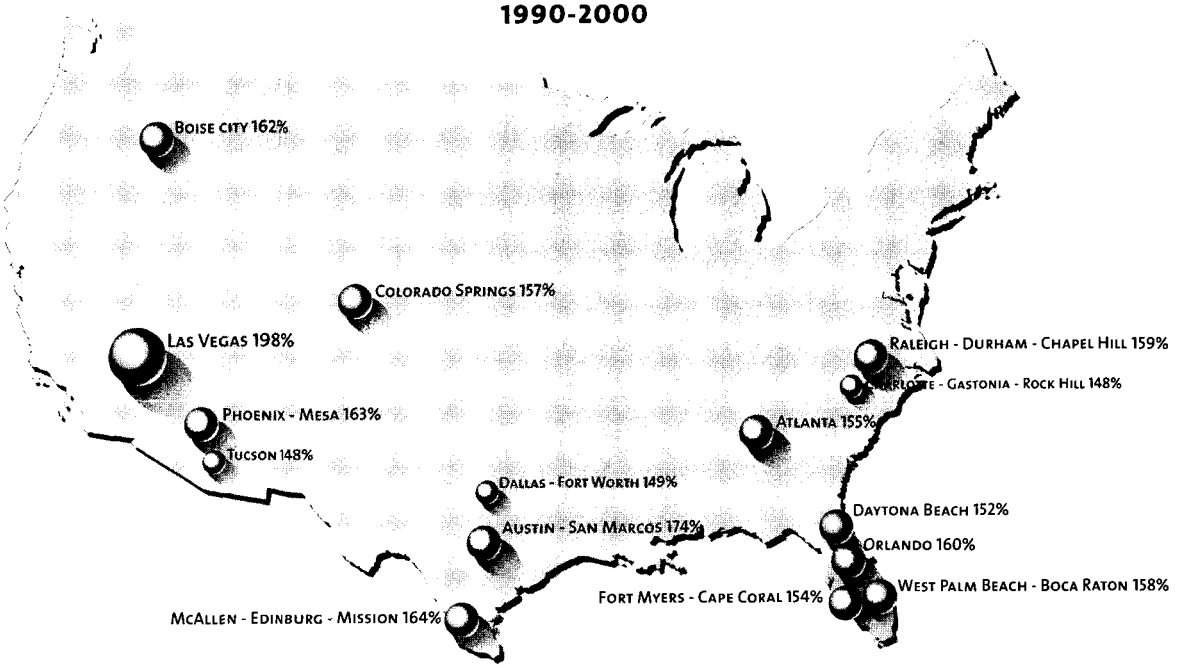
LARGE METROS WITH GREATEST MIDDLE-AGED GROWTH, 1990-2000


Boise City 162%
Colorado Springs 157%
Las Vegas 198%
Phoenix - Mesa 163%
Tucson 148%
Dallas - Fort Worth 149%
Austin - San Marcos 174%
McAllen - Edinburg - Mission 164%
Fort Myers - Cape Coral 154%
Atlanta 155%
Raleigh - Durham - Chapel Hill 159%
Charlotte - Gastonia - Rock Hill 148%
Daytona Beach 152%
Orlando 160%
West Palm Beach - Boca Raton 158%

NOTE: Among 102 metros with 2000 populations greater then 400,000. Metro areas refer to CMSAs, MSAs, and (in New England) NECMAs, defined by the Office of Management and Budget. Aged 35-54 population in 2000 as percent of aged 35-54 population in 1990.

SOURCE: William H. Frey analysis of 2000 U.S. Census.

young, and are now reaping the benefits by retaining them in their peak earning years.

AGING BOOMERS, AGING SUBURBS

The graying in place of the boomers is debunking another stereotype: suburbs as reservations for young families with children. The choices of the boomers' parents created that stereotype. But as the first generation native to the suburbs has aged, so have the suburbs. More 35-54 year-olds live in the suburbs than any other age group. And during the 1990s, boomer-induced aging was more pronounced in the 'burbs than in central cities.

This trend will inevitably lead to conflict on local spending between young families with children and the burgeoning numbers of empty-nesters. But the retention of well-off boomer middle-agers should serve as an economic plus for both suburban tax bases and businesses that rely on affluent customers.

URBAN PLAYGROUNDS FOR EMPTY NESTERS

Not all boomers are nestled in comfortable suburbs. A good many have chosen to stay in the city or to relocate there after the kids have moved out. Indeed, some form the backbone of a handful of cities that are magnets to affluent adults, with cultural amenities and housing that is too expensive for young families. San Francisco and Seattle lead the pack, each with more than two middle-aged boomers for every child. They are quintessential boomer playgrounds that have stood the test of time. M

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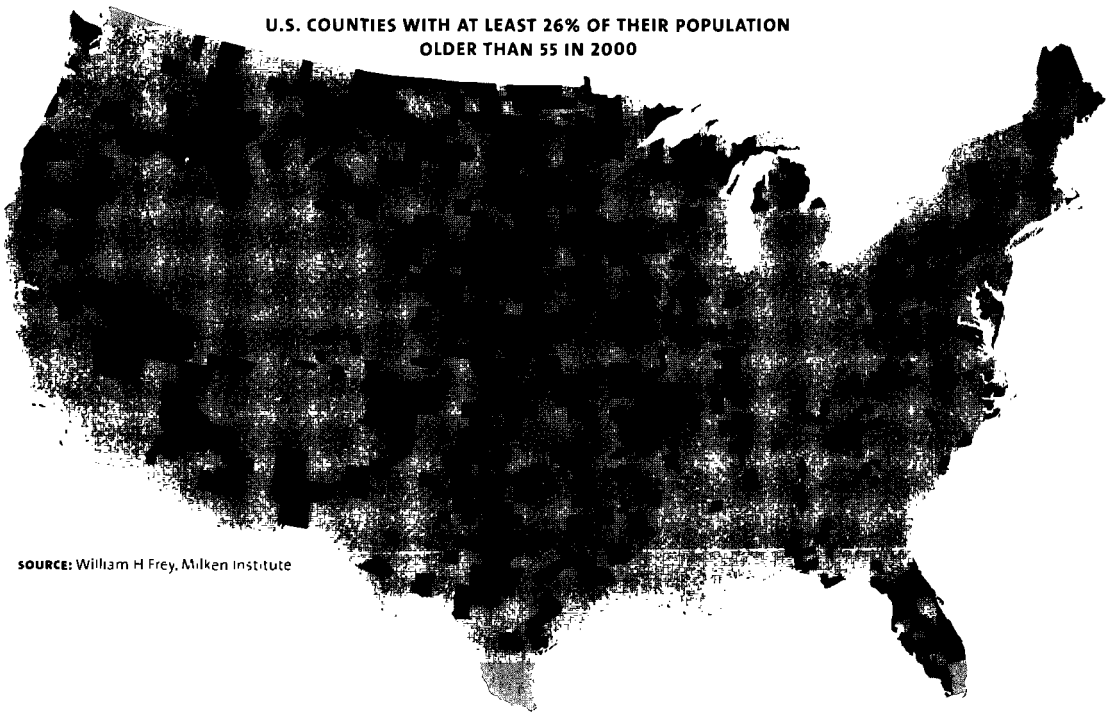
OLDER THAN BOOMERS

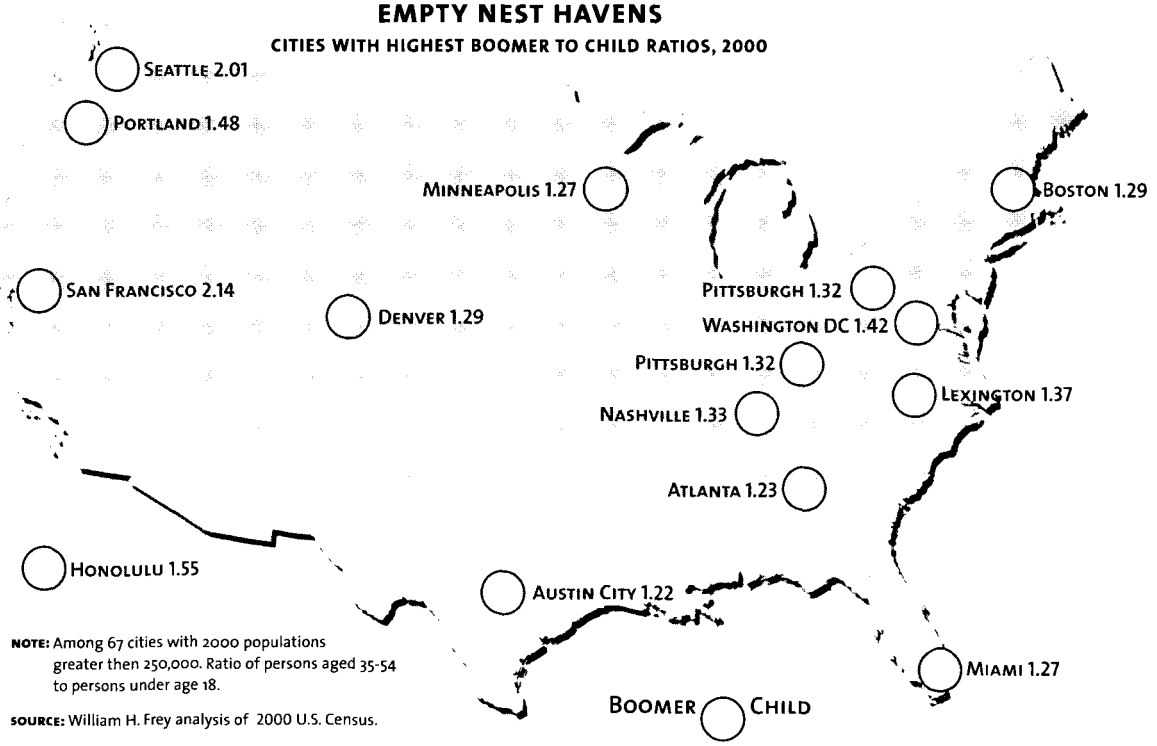
U.S. COUNTIES WITH AT LEAST 26% OF THEIR POPULATION OLDER THAN 55 IN 2000



SOURCE: William H Frey, Milken Institute

EMPTY NEST HAVENS

CITIES WITH HIGHEST BOOMER TO CHILD RATIOS, 2000



NOTE: Among 67 cities with 2000 populations greater then 250,000. Ratio of persons aged 35-54 to persons under age 18.

SOURCE: William H. Frey analysis of 2000 U.S. Census.

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BY TIM FERGUSON

For some time, the city-planning vogue has been a school known as New Urbanism or Sustainable Communities. Neo-traditional by some people's lights, it is aimed at healthy socialization, incorporating diverse but properly scaled elements: front porches, walkable streets, transit corridors, sidewalk-close commerce – you get the picture.

The common objective is to retard sprawl, foster human contact and get the beastly automobile under control. If "it takes a village," this is the village. New towns – Seaside FL, the Kentlands MD, the Laguna West development near Sacramento – are examples. Dozens of less ambitious projects have put the model into varying degrees of practice.

But if New Urbanism principles are to reach far across the American landscape, they have to be applied not just to the new, but also to well-worn districts and suburbs. And here the concepts encounter problems, as one moving part affects another and everything rubs up against someone's comfort zone.

A cautionary lesson may be found close to my home, in the case of *Target v Santa Monica.* This is not literally a legal matter, although it could have come to that if the Minneapolis-based Target, one of America's biggest discount department store chains, had chosen to play it that way. Target and its development partner spent three years and more than $250,000 trying to get permission to build a primped-up flagship in the midst of Santa Monica's revived downtown, only to be turned down this winter because – well, that's the story.

From the standpoint of New Urbanists, Santa Monica (pop. 89,000) has done just about everything right over the last two decades. A beach town that grew from early airplane industry incubator to affordable, breezy bedroom for Los Angeles by mid-century, it caught the California coastal updraft in real-estate prices in the 1970s. At that point, a city council under the thrall of residents Tom Hayden and Jane Fonda gained national attention by imposing strict residential rent controls and other market-dampening measures that were manna for Santa Monica's significant apartment-dwelling constituency.

Rent controls are not necessarily part of New Urbanism, but the care and feeding of a mixed population is. Most Santa Monica city councils since have tended to low-income needs through a variety of support programs, housing allocations and targeted services, even as the city became an ever more desirable address for the affluent – not to mention for the Milken Institute.

The city operates 167 (going on 200) clean, efficient buses that ferry passengers around

TIM FERGUSON is the Los Angeles bureau chief for *Forbes* magazine.

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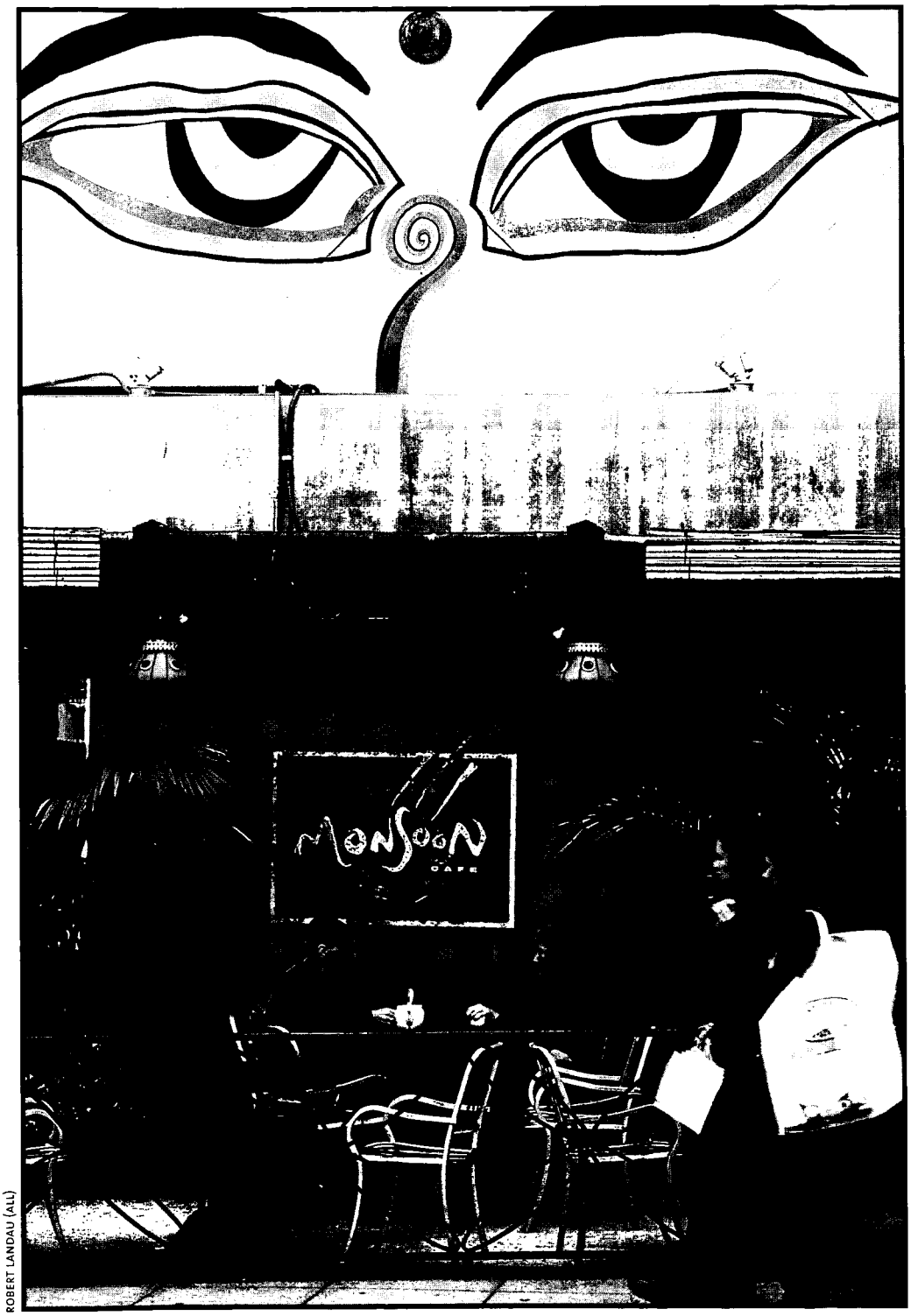

ROBERT LANDAU (ALL)

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town and throughout much of the west side of Los Angeles for a fare of 50 cents or less. And just this year, the city imposed an ambitious "living wage" ordinance designed to close the income gap.

But even as the price of Santa Monica's homes went through the roof in the 1980s, the city had to contend with a dowdy, failing downtown business district – a problem shared with myriad other mature locales. The small shops had lost sales to outlying megastores. So Santa Monica took an early flier on the kind of civic infrastructure that since has become the rage across the nation. It closed three central city blocks to auto traffic and relandscaped them as a pedestrian strip. A dozen years later, the Third Street Promenade is one of America's glittering retail success stories.

The Promenade did more or less what New Urbanists want to do with the village square: bring a variety of people together by eliminating cars and other obstructions, and create an environment in which spontaneous interaction is easy. "Mixed use" is encouraged, usually in the form of apartments or office suites on top of storefronts. Santa Monica's formidable numbers of homeless bring an edgy urban feel to the Promenade, yet are not sufficiently threatening to scare away the shoppers.

The big gains at the cash registers (and concurrently, bookings at a string of high-end hotels now lining the beachfront a few blocks away) served to bolster city revenues – and by more, perhaps, than those not familiar with California's unusual fiscal profile would expect. The state's municipalities primarily depend on sales and excise taxes, earning little from property levies. In the last decade, Santa Monica's sales tax receipts have risen to $26.5 million from $16.3 million; taxable sales by Promenade stores went up sixfold. What's more, hotel tax revenues jumped to $19.7 million from $6.3 million.

Commercial revitalization has helped to pay for Santa Monica's welfare state pretensions. But the progressive vision has collided with two seemingly immutable facts of life. First, when receipts go up, so do commercial rents. And second, when people – even good liberals – can afford to keep and use automobiles, most of them will.

Rents for ground-floor space along the Promenade tripled from 1995 to 2000. No surprise, JC Penney and Woolworth's pulled up stakes, along with dozens of smaller retailers and $5 lunch spots. Sears still operates downtown, but it is separated from the Promenade by a 1970s-style indoor mall and is out

How does a prominent New Urbanist respond to the Santa Monica decision? I asked the Florida-based Andres Duany, who with wife and partner, Elizabeth Plater-Zyberk, is considered a pioneer architect-planner of this school. His reply:

We have no objections to Big Box retailers so long as they are embedded within or associated at the edge of Main Street retailers, always hiding their parking as did the department stores of old.

Of course, local stores are better as they plow back more of their profits into the community, but those rarely provide lower prices.

As far as traffic is concerned: something or other will fill the roadway capacity. If not the Big Box, then something else.

If the problem is snobbism, then it is misplaced in the case of Target, as it is the one chain that provides well-designed goods.

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of strolling range.

In have come Restoration Hardware, Sephora, Banana Republic, Barnes & Noble, Pottery Barn, Discovery Store and PF Chang's. There are few spots left for sundries and basic housewares and little in the way of bargain apparel. Santa Monicans must drive five miles or so to the nearest big-box discounters.

This was the void that Target sought to fill with 175,000 square feet on the site of a former, family-run department store, now a parking lot. In deference to the city's ecological fetishes, the company promised a totally green building, including off-the-grid power from renewable sources, clean-fueled delivery trucks and zero emissions to storm drains. Target also pledged money to various community support groups for children, seniors and battered women – philanthropy, incidentally, much in keeping with the corporation's do-gooder reputation.

But opponents surfaced, groups ranging from nearby condo dwellers fearing noisy deliveries, to antiglobalists objecting to products produced in low-wage countries, to unionists balking at Target's labor policies, to aesthetes dreading the addition of a giant "suburban" store to the ostensibly eclectic (if increasingly upscale) downtown retail mix. Target was to sit next to a Toys "R" Us that already offends local sensibilities. But the final design of the proposed structure bore little resemblance to the typical Target big box and left room only for architectural nit-picking.

The real deal-breaker was fear of the crowds that Target would draw. Perhaps 7,000 additional car trips a day meant that downtown streets, which have already filled as the Promenade's popularity grew and other developments sprouted in Santa Monica, would become appreciably more congested. Store officials and city staff gamely proposed mitigations. Target said it would give away bus tokens and open to a new mass transit ter-

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minal. But no one could wish away the additional vehicles.

Now, many a New Urbanist welcomes bustle – even combustion engine-aided bustle – in the city center, but Santa Monicans broadly parted company with them here. Whether comfortable homeowners or avant-garde artists, they told the city council they didn't want to wait in more traffic.

And wait they would have. Because, except for the committed or constrained – here, we are talking about the very old, very young or very poor – residents of Santa Monica, of California, of nearly anyplace in the United States outside of a handful of cities, default to the car for trips of more than a few blocks. This is particularly true when a purchase is contemplated; only bag ladies walk around with shopping bags in mainstream America.

Santa Monica's commercial revitalization is, in fact, evidence of this reality. Easy access to 10 municipal parking structures with very cheap rates is considered essential to the Promenade's success. Indeed, for realists, part of the attraction of the Target store was the company's willingness to build underground parking for hundreds of cars above and beyond what it needed for its own clientele.

Santa Monica and almost everywhere else in America, it seems, prefers New Urbanism Lite: at the beginning and end of each stroll is a car trip. A tribune for the movement, James Howard Kunstler, wrote in his book, *Home From Nowhere*: "Most urban areas and even many small towns (like my own) now suffer from density deficits. There are not enough people living, or business activities, at the core to maintain the synergies necessary for civic life."

But most Americans don't agree. They may be attracted to congestion as tourists in the great cities. They may even want pedestrian congestion in their own village core. But they don't want it getting in the way of their everyday life, which is to say their driving life. Wait more than one cycle at a stoplight? Fuhgeddaboutit. That is why in-fill development, which is what Target really represented, is great as a public policy nostrum and a political loser at the neighborhood level.

Target thought it had a fighting chance in Santa Monica. Thanks in part to its seeding of the grassroots, scores turned out to urge the city council to approve the store. Any number of speakers claimed to be part of one constituency or another that had put the city's left-progressive coalition in power, and some threatened retribution at the polls if they didn't get bargains in the bargain. Seniors were the most vocal.

But the council, evidently sensing the larger and somewhat latent public desire, turned down the development 5 to 2. The greenest members of the council gave a thumbs-down, despite all the company's gestures. Also among the five were the two moderates who generally represent what radicals in town would dub bourgeois interests.

Everyone has a voice in Santa Monica, democracy being an implied virtue of New Urbanism. And compared with most of California, an unusual number of city residents are transit dependent or auto-defiant. But Santa Monica would not secure an affordable retail base for them, if that meant antagonizing the local motorists. The first priority, it turns out, is traffic flow.

So the question remains for New Urbanist wannabes considering community retrofits: how do you foster an environment that accommodates cars, but reaches the critical mass to support anything more than a boutique Broadway? Santa Monica can't get there. In the meantime, it will be a prosperous but politically precarious place. MI

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TO THE EDITOR:

I was puzzled by Rob Norton's observation (Second Quarter 2001) that Reagan "succeeded in pushing through a major tax cut – restraining the growth of federal revenues...." From 1983 to 1988, individual income tax receipts rose by $115 billion. Is Norton arguing that revenue growth would have been greater had there been no rate cut in 1981?

Then we are told that, circa 1999, "the Republicans were now against the idea of letting budget surpluses accumulate, because to do so forestalled the possibility of cutting taxes." My recollection is that conservatives opposed letting surpluses accumulate because the Democrats (and some Republicans) would spend the surpluses on ever-bigger government. Surpluses ought to be an excellent argument for cutting taxes. (As for instance, now.) It was a lot tougher selling the 1981 rate cuts in the face of a rising deficit.

Finally, Norton tells us that the George W. Bush administration "has proposed a tax cut that would devote nearly all of the surpluses over the next decade for reducing taxes." The projected surplus is $5.6 trillion over 10 years. Bush proposed a (supposedly) revenue-reducing tax cut of $1.6 trillion (28 percent) over that period. How does Norton get "nearly all" out of 28 percent?

John McClaughry, President
Ethan Allen Institute, Concord, Vermont

The writer was senior policy advisor in the Reagan White House.

ROB NORTON REPLIES:

Taking the points in order. Yes, I'm arguing that federal revenue would have grown more in the absence of the 1981 tax cut. And I don't think there's much counter-argument, except from the most dogmatic supply-siders, who believe that tax cuts are inevitably self-financing. The facts support my view: from 1971 to 1981, total federal receipts, adjusted for inflation, increased at an annual compound rate of 3.6 percent; personal income tax receipts at a rate of 4.0 percent. From 1981 to 1991, total federal receipts increased at an annual rate of 1.6 percent; personal income tax receipts at a rate of 0.9 percent.

On the second point, if conservatives opposed letting surpluses accumulate to forestall spending on bigger government, the only way to accomplish their goal was to call for tax cuts, and if the surpluses did accumulate, there would be no tax cuts. So which came first, the chicken or the egg?

Finally, the projected surplus is indeed $5.6 trillion over 10 years, but unfortunately that gross amount is not available for tax cuts or for anything else. According to the Congressional Budget Office, the projected total surplus for 2002 through 2011 is $5.6 trillion. But $2.5 trillion of that is earmarked for Social Security and $400 billion for Medicare, leaving an "available on-budget surplus" of $2.7 trillion. Subtract the sums needed to keep spending constant as a share of GDP and you're left with $1.7 trillion. Subtract the effect of fixing the alternative minimum tax and the cost of renewing existing tax breaks set to expire, and the available surplus is $1.3 trillion.

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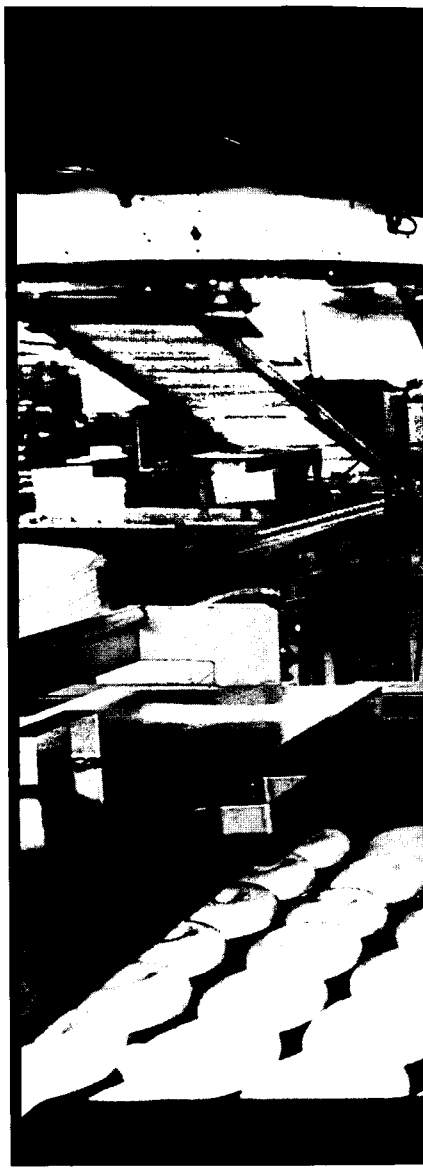
To Rise Above

Upgrading the skills of the under-employed



by Michael S. Bernick

With unemployment remaining near postwar lows in spite of the current economic slowdown, California's policymakers are increasingly focused on the state's working poor – the millions with jobs who are not earning enough to lift their families much above the poverty line. By the same token, with inflation seemingly tamed and the Federal Reserve Board committed to keeping the economy out of deep 1970s-style recessions, the issue of upgrading the earnings prospects of the working poor has risen to the top of the employment-policy agenda nationwide.

Over the past three decades, a job training system has developed in America that works well in placing unskilled workers in entry-level jobs. The system, though, has limited contact with people already employed.

What could be done to create a way up from near-poverty? Nothing easy. While the policy literature is littered with seemingly sensible tracts on how to train people who have jobs for better jobs, it hasn't had much practical impact. And for anyone working

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JIM SAAH (ALL)

on the front lines of the anti-poverty war, this failure should be a red flag.

In California (as elsewhere) the existing training system is a highly fragmented, dependent on hundreds of community-based agencies and proprietary schools, dozens of community college districts, and thousands of adult-education classes. Their money comes from a mix of state and federal sources, particularly the federal Workforce Investment Act of 1998. Funds in California from that legislation totaled $630 million last year.

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JOB TRAINING

Most job training is closely connected to jobs, though, with employers helping to shape the curriculum and strong follow-up efforts in job placement. This is most true of programs operated by community-based agencies and by proprietary schools that must place students in jobs in order to remain eligible for funds. It is less true of the community college programs. But even the community colleges are working more closely with local employers to ensure placements.

TOP 10 OCCUPATIONS WITH THE FASTEST GROWTH IN CALIFORNIA, 1998-2008

OCCUPATION	NUMBER OF JOBS 1998	NUMBER OF JOBS 2008	ABSOLUTE CHANGE	PERCENT CHANGE	EDUCATION/EXPERIENCE (BLS TRAINING LEVEL)
Systems Analysts - Electronic Data Processing	59,400	113,000	53,600	90.20%	Bachelor's Degree
Computer Support Specialists	57,600	109,400	51,800	89.90%	Bachelor's Degree
Medical Assistants	39,500	70,000	30,500	77.20%	Moderate-term On-the-job Training
Computer Engineers	53,700	94,700	41,000	76.40%	Bachelor's Degree
Medical Records Technicians	9,800	17,000	7,200	73.50%	Associate Degree
Physicians' Assistants	5,700	9,600	3,900	68.40%	Bachelor's Degree
Paralegal Personnel	12,400	20,800	8,400	67.70%	Associate Degree
Database Administrators	12,300	20,500	8,200	66.70%	Bachelor's Degree
Respiratory Care Practitioners	8,100	12,800	4,700	58.00%	Associate Degree
Human-Services Workers	17,400	27,200	9,800	56.30%	Moderate-term On-the-job Training

SOURCE: State of California Employment Development Department

Of the more than 200,000 participants enrolled in training in California from 1994 through 1999 under the Workforce Investment Act and its predecessor, the Job Training Partnership Act, more than two-thirds were placed in jobs. What's more, the placement rate rose steadily, from 54 percent in 1993-94 to 76 percent in 1998-99.

The limits of the job training system's capacity to reduce poverty in California, as elsewhere, lie not in the mechanics of imparting skills but rather in the other dynamics of poverty: chiefly, teen pregnancy and single-parent households where adults are handicapped by limited education, drug and alcohol abuse, and mental illness.

Further, with few exceptions, the system does not enroll people who are already working, even though the Workforce Intervention Act allows paying for upgrading the skills of the employed. Over the first year of the program's operation, only a handful of the 51 local Workforce Investment Boards in California considered adding skills-upgrading to their offerings.

MICHAEL BERNICK directs California's Employment Development Department.

THE EXCEPTION TO THE RULE

One federal program that has funded training for low-wage workers in recent years is the welfare-to-work initiative. Though the bulk of the money in that program has been used to place welfare recipients in jobs, states can pay for skills upgrading for those already working. The limited impact, though, suggests the formidable obstacles to such training.

California has had great success both in reducing its welfare rolls and in placing welfare recipients into jobs. From January 1995 to December 1999, welfare rolls in California dropped by 38 percent. Some were removed from the rolls after more careful income checks showed they were ineligible. But the majority were removed because they found jobs, either on their own or through the state's extensive job placement network.

As researchers soon noted, though, many of these former welfare recipients were not

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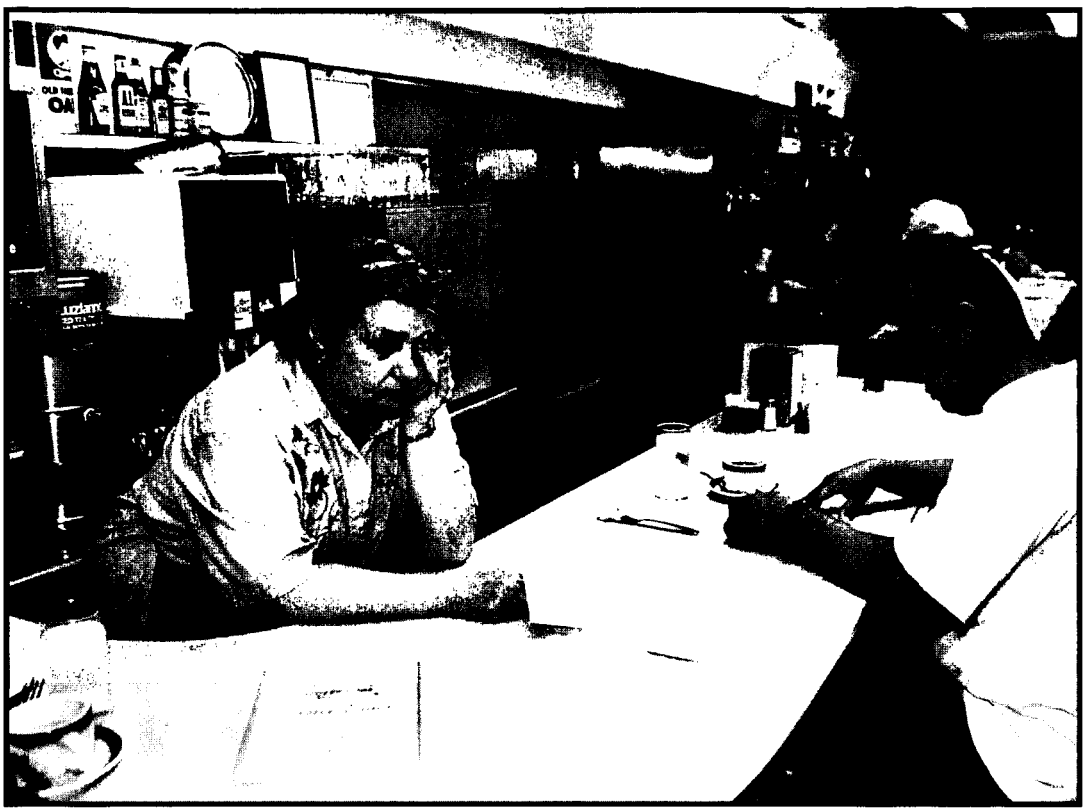

earning enough to be above the poverty line. The Los Angeles Economic Roundtable, a non-profit, non-partisan research organization, tracked the earnings of nearly 100,000 welfare-to-work participants who found jobs between 1990 and 1997. Just one in five were able to obtain employment that pulled them out of poverty within three years. The remaining 80 percent remained poor.

By the same token, a study of California welfare-to-work participants by the San Francisco-based non-partisan Public Policy Institute found that 70 percent did not earn enough to lift a family of three out of poverty. National studies by the independent Manpower Demonstration Research Corporation and the United States General Accounting Office have reached similar conclusions.

State and local employment officials in California responded to these findings with several skills-upgrading efforts in 1999 and 2000. A number of county welfare departments offered continued career assistance – job counseling to resolve workplace problems, help in finding free skills-upgrade courses at community colleges and in identifying better-paying jobs.

Riverside County (east of Los Angeles), long a leader in welfare reform, developed the most extensive welfare-to-work skills-upgrading system in the state. The county places the highest priority on finding remunerative work for welfare recipients. However, welfare recipients who are working at least 20 hours a week may apply for skills upgrading – primarily through reimbursement of the costs of training undertaken on their own time. Over the past two years, some 360 peo-

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ple have taken advantage of that option. They include cashiers, receptionists and home health aides, who are taking classes to become office assistants with computer skills, medical office managers, or medical transcribers.

Among these 360, the majority completed their training and advanced to higher paying positions that put their families above the poverty line. It's worth noting, though, that they represented less than 12 percent of the eligible welfare recipients in Riverside County. The great majority abstained, typically because they are single parents already hard pressed to meet family and job obligations.

This has been the pattern elsewhere. Since most employers are not in a position to give former welfare recipients time off with pay for skills upgrading, employees must do it on their own time. Welfare-to-work agencies have tried several approaches to encourage workers to take classes, among them creating family learning centers that serve dinner and provide child care, and e-learning strategies that include giving welfare recipients computers to learn from home. But these approaches have found few takers.

One highly publicized program that involved e-learning was ClickStart in Oakland, launched in February 2000 by President Clinton and Silicon Valley business leaders, who trumpeted it as an important step bridging the digital divide. It provided computer training and computers to low-income women, particularly single mothers. But *The San Francisco Chronicle* found the program had little impact on employment or wages.

Even if employers were willing to give paid time off to welfare recipients to upgrade their skills, there would be serious fairness issues. Why should a waitress who has not gone on welfare be given less training than someone who took a waitress job after being on welfare? Indeed, why shouldn't preference be given to those who eschewed welfare?

AN INDUSTRY-SECTOR APPROACH TO SKILLS UPGRADING

An alternative to the welfare-to-work approach is an approach that emphasizes promotion from within the firm or industry, and that makes on-the-job skills upgrading available to all low-wage workers. This approach, often described as job ladders, holds out the promise of more systematic job mobility. It seeks to alter the structure of mobility in an industry, and envisions low-wage workers regularly gaining new skills and advancing in pay and responsibility.

The job ladders approach has been discussed periodically by labor market economists and employment officials in California over the past 35 years. However, it has not been implemented to any significant extent.

An examination of the job structures of major California industries suggests initial promise in job ladders, as most of these industries – health care, hospitality, banking and finance, and information technology, to name a few – offer a variety of jobs with higher pay and skill levels than their entry-level jobs.

An example is health care, notably skilled nursing and acute care facilities. In skilled nursing, the main front-line job is certified nurse assistant, which provides basic patient services. In California, that job pays roughly $15,000 to $20,700 per year. There are several ways up, including restorative nurse-assistant and psychiatric aide (both of which can mean a pay increase of $3,000 to $4,000 per year) or into administration as a medical records technician or medical data systems clerk (which can pay $4,000 to $10,000 more per year). Higher up yet is the licensed vocational nurse, with pay that can reach $40,000 annually, and

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registered nurse, with pay ranging up to $67,000.

In an acute-care facility, the nurse-assistant front-line job generally pays $5,000 per year more, so such workers often move from skilled nursing to acute care. Once a worker is in acute care, advancement to vocational nurse and registered nurse is possible.

Or take the hotel field. Entry-level jobs in major hotels – like front desk agent or telephone operator or even room attendant – can lead to more than 40 job categories with higher pay.

In fact, a significant percentage of California workers today are following these job ladders in health care, hospitality and other fields to higher-paying jobs. Though far more research needs to be undertaken on job mobility in California – neither the industries themselves nor labor economists now track this sort of mobility – for many, lower wage jobs are not dead-end jobs.

TOP 20 OCCUPATIONS WITH THE GREATEST ABSOLUTE JOB GROWTH IN CALIFORNIA, 1998-2008

OCCUPATION	NUMBER OF JOBS 1998	NUMBER OF JOBS 2008	ABSOLUTE CHANGE	PERCENT CHANGE	EDUCATION/EXPERIENCE (BLS TRAINING LEVEL)
General Managers, Top Executives	366,600	452,200	85,600	23.30%	Work Experience, plus a Bachelor's or Higher
General Office Clerks	354,000	435,900	81,900	23.10%	Short-term On-the-job Training
Salespersons, Retail	423,100	500,900	77,800	18.40%	Short-term On-the-job Training
Cashiers	307,100	375,800	68,700	22.40%	Short-term On-the-job Training
Systems Analysts - Electronic Data Processing	59,400	113,000	53,600	90.20%	Bachelor's Degre
Guards and Watch Guards	124,900	176,900	52,000	41.60%	Short-term On-the-job Training
Computer Support Specialists	57,600	109,400	51,800	89.90%	Bachelor's Degree
Receptionists, Information Clerks	159,800	211,400	51,600	32.30%	Short-term On-the-job Training
Registered Nurses	172,100	221,200	49,100	28.50%	Associate Degree
Teachers - Secondary School	128,500	176,900	48,400	37.70%	Bachelor's Degree
Teacher Aides, Paraprofessional	90,900	136,500	45,600	50.20%	Associate Degree
Teachers - Elementary School	176,200	220,900	44,700	25.40%	Bachelor's Degree
Truck Drivers, Light	140,600	184,800	44,200	31.40%	Short-term On-the-job Training
Laborers, Landscaping/ Groundskeeping	128,600	169,900	41,300	32.10%	Short-term On-the-job Training
Waiters and Waitresses	204,500	245,600	41,100	20.10%	Short-term On-the-job Training
Computer Engineers	53,700	94,700	41,000	76.40%	Bachelor's Degree
Hand Packers, Packagers	99,000	133,100	34,100	34.40%	Short-term On-the-job Training
Janitors, Cleaners - Except Maids	195,700	227,900	32,200	16.50%	Short-term On-the-job Training
Medical Assistants	39,500	70,000	30,500	77.20%	Moderate-term On-the-job Training
Combined Food Preparation & Service	181,300	211,000	29,700	16.40%	Short-term On-the-job Training

SOURCE: State of California Employment Development Department

But the structure of skills upgrading among California employers is uneven, with upgrading efforts limited mainly to the largest employers. The great majority of employers have neither the resources nor the economic rationale to initiate skills-upgrading efforts, which means that the greater number of California low-wage workers are out of luck.

Since there is great labor mobility among firms, individual employers – especially smaller employers – lack the incentive to invest in worker training. This is especially true of investment in low-wage workers, where job turnover is the most extensive. Just as important, most employers do not have a large number of job openings at any one time above the entry level.

In light of these realities, any effective skills upgrading system must be industrywide. At California's Employment Development Department, we started with the two labor market intermediaries that do operate across

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firms: trade associations and labor unions. Both groups can create opportunities for pooling jobs among firms so that there are significant opportunities for advancement. In addition, these groups are able to spread the costs and benefits of training among employers, to pool the risks of job turnover, and to create a complex training infrastructure that is usually possessed only by the largest employers

California's major industries – banking, retailing, long-term care health facilities, information technology – all have trade associations. For the most part, these associations concentrate efforts on government lobbying and have limited contact with work-force issues. Yet, as we met with the industry associations throughout 2000, they expressed interest in skills upgrading for two main reasons. First, nearly all industries were experiencing a high turnover of workers in entry-level jobs. The California Health Facilities Association, for example, estimated turnover among nursing assistants at nearly 100 percent annually. The industry association saw an opportunity to reduce turnover by holding out the promise of job mobility in exchange for performance in an entry-level job. Second, the very tight labor market in 2000 meant employers needed workers in nearly all skill categories.

For California labor unions, skills upgrading coincided with an initiative, Working for America, recently launched by the national AFL-CIO. Working for America trumpeted high-road worker training, and its first pro-

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jects included skills-upgrading attempts with garment workers in New York, hotel workers in Las Vegas, and health-care workers in Philadelphia.

Though both the industry associations and labor unions in California were able to contribute some staff time for a skills-upgrading initiative, neither provided training funds. We found the money in the Employment Training Fund, the state-sponsored fund financed by a surcharge on the state's payroll tax that brings in more than $100 million a year. In October 2000, the fund's board allocated $15 million for Career Ladders for the 21st Century, with the promise of more money if the program showed results.

INSTITUTIONALIZING SKILLS UPGRADING

Other labor market intermediaries can also play a role. Two of these are familiar in the job training system: community colleges and the employment service. The other two are rarely involved in government job training: private placement firms and the fast food industry.

Community Colleges. The community college system in California has had several, sometimes conflicting, missions. These include preparing students for four-year colleges and issuing Associate of Arts degrees, as well as offering training for jobs ranging from dental hygienist to auto mechanic. Though the training is usually competent, it is not usually tied to job placement or done as part of an industry-based effort. By early 2001, though, the community college leadership had decided on its own training effort for the working poor. The mechanics of this effort are still being developed, but the core will definitely involve incumbent worker training with the industry associations and labor unions. The training would be paid for by a combination of the colleges' operating funds and government grants – with the latter providing the incentive to participate.

Employment Service. The state's employment service brings two important strengths to worker skills upgrading. The first is research capacity, including the ability to track participants in a career ladders program. The second is job placement: the employment service can provide assistance to employers in filling the entry-level positions left open as workers advance. Priority might be built into the system for employers who fill vacated positions after helping their own low-wage workers to advance.

OCCUPATIONS WITH THE MOST OPENINGS CALIFORNIA 1998-2008

OCCUPATION	NUMBER OF NEW JOBS 1998-2008
Salespersons, Retail	234,400
Cashiers	217,500
General Office Clerks	191,300
Waiters and Waitresses	165,100
General Managers, Top Executive	157,300
Combined Food Prep and Service	137,800
Food Preparation Workers	99,700
Teachers - Secondary School	97,200
Teachers - Elementary School	90,600
Guards and Watch Guards	89,600
Receptionists, Information Clerks	87,100
Laborers, Landscaping/Groundskeeping	85,800
Registered Nurses	81,600
Janitors, Cleaners - except Maid	78,200
Truck Drivers, Light	67,600
Hand Packers, Packagers	62,800
Secretaries, General	62,200
Systems Analysts - Electronic Data Processing	59,000
Teacher Aides, Paraprofessional	58,600
Computer Support Specialists	57,000

SOURCE: State of California Employment Development Department

Private Placement Firms. These firms, like Manpower Inc., Apple One, and Pro Staff, have exploded in size in California during the past decade. Increasingly, these firms make permanent placements as well as temporary ones, and serve as the employer of record for long-term assignments. Joint Venture Silicon Valley, a non-profit community foundation,

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estimates that more than 35 percent of the information-technology jobs in Silicon Valley are now filled by people hired on the payrolls of private placement firms.

Private placement firms traditionally have had no role in training. In fact, the training establishment has shunned them, as their job placements are seen as short-term, low-paid, and lacking benefits. But, more and more private placement jobs come with medical insurance, as well as hourly wages of more than $14. And there's little doubt that the private placement firms could add value to the training system.

First, since they interact daily with employers, they have a keen understanding of the jobs emerging in local labor markets. Second, these firms, driven to minimize unnecessary costs, are inclined to provide training that is closely tied to employers' needs. Third, even temp jobs filled by the placement firms can lead to regular employment or can provide needed work experience.

The Fast Food Sector. Consider another odd man out. The fast food industry in recent years has served as an excellent work experience and training venue, particularly with young people. Workers learn the skills of showing up on time, following orders, and dealing with customers – precisely the skills that employers say are most important.

Within each McDonald's (80 percent of which are individually run franchises), there is limited room for mobility. A single restaurant might have 40 front-line workers (some full-time, most part-time), one or two assistant managers, and just one manager. But McDonald's can feed workers to other industries – particularly industries like information technology, where even the entry-level service jobs pay $12 to $14 an hour. In one scenario, front-line workers who prove themselves for 18 to 24 months would be given priority job search assistance by the state employment service and the private placement industry. Since few workers stay at McDonald's for more than two years, an individual McDonald's franchise would not be in danger of losing experienced employees. What's more, the prospect of placement into better jobs would serve as an incentive for front-line workers to build good employment records at McDonald's.

THE REALITY TEST

How realistic is the development of an extensive system of incumbent-worker training? Prominent officials, including two former secretaries of labor, have written books advocating worker training approaches, and major foundations, including Carnegie and Century, have invested large sums in developing programs for the working poor – all to very little effect. Their proposals required the creation of new government bureaucracies totally at odds not only with the political climate, but also with the lessons learned by job training practitioners at the state and local level. For example, an expensive system of job relocation appropriate for a welfare state like Sweden makes little practical sense in the United States.

The better skills-upgrading projects that have been implemented in recent years have been mainly regional efforts, sponsored by labor unions or industry associations like the Cape Cod Career Ladders, the Wisconsin Regional Training Partnership, and the Paraprofessional Healthcare Institute. These projects share several characteristics. Each is industry-focused and invests in understanding the work force of a particular industry. Each starts small. Each maintains a lean administrative staff.

Nuts-and-bolts knowledge is critical to an

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Where the Jobs Will Be

Considerable attention has been paid to the rapid growth of skilled computer-related jobs, and their potential for giving low-wage workers a way up. However, the best guess is that low-tech jobs will continue to play a significant role in socioeconomic mobility.

Every two years, the Employment Development Department provides job projections for jobs in California; the most recent cover the period from 1998 to 2008. Several of the high-tech categories are at the top of the list in terms of percentage growth. However, the top 20 list in terms of the absolute numbers of jobs created looks rather different.

It includes low-tech categories, including general office clerks, retail salespersons, cashiers, security guards and receptionists. Only the top category, general managers/executives, is well paid, though three other categories – registered nurses, teachers and medical assistants – represent solid middle-income jobs.

The picture looks quite different when one looks at projected job openings, incorporating not only the new jobs that will be created, but also the turnover in the jobs. At least 12 of the top 20 categories are jobs that require limited skills and that pay on the lower-end of the scale. These include cashiers, general office clerks, waiters and waitresses, food preparation workers and guards.

effective skills upgrading program. As Steven Dawson, president of the Paraprofessional Healthcare Institute, notes, many nurse assistants enjoy the patient-contact part of their job and are good at it, and taking them away from this work may reduce patient care as well as their own job satisfaction. Dawson's hard-won caution has not led to inactivity, though. Rather, it has enabled him to develop realistic skills-upgrade projects with help from unions and employers. He also has developed wage-subsidy projects that encourage well-performing nurse assistants to stay in direct service and allow them to earn more money through performance and experience.

In Ignazio Silone's famous novel, *Bread and Wine*, the recent university graduate Don Paolo seeks to improve the lot of the peasantry. But, when he goes out into the villages, he is dismayed to find his theories bear little resemblance to reality:

> Don Paolo went to his room to reflect on the peasants ... and their lives. The idea occurred to him of using his remaining time at Pietrasecca to finish his essay on the agrarian question. He took his notebook from his bag and started reading the notes he had taken. He read them through and was astonished and dismayed at their abstract character. All these quotations from masters and disciples on the agrarian question, all these plans and schemes were the paper scenery in which he had hitherto lived.

So much of the literature on the working poor is "paper scenery," the work of economists who seek to help the working poor, but who do not learn the realities of the work force or the industry or the unions. The task of getting better jobs for people who already have jobs requires a far more intimate understanding of labor markets and the people who make them run. M

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Risk and the New Economy

Or why, when profits are good, they should be very, very good

By Josh Lerner

What is an adequate return on an investment in a new drug, computer program or computer chip? Ask anyone who got a passing grade in Econ 101, and you're likely to get what is widely assumed to be the gospel according to Adam Smith: whatever return the free market generates.

But it isn't quite that simple. For one thing, there may not be a free market. Innovations are often protected by patents or copyrights, in effect producing a government-mandated monopoly. And what the government giveth, it can take away by adjusting the length or breadth of the protection, or by requiring the beneficiary to license the use of the intellectual property.

For another, the market may, in effect, be protected by economies of scale in production, or by "network effects" that make an innovation more valuable to all if more people use it. And if the innovation does, indeed, create a "natural" monopoly (think electricity distribution) there is a long, sometimes honorable history of profit regulation in "the public interest."

Last but hardly least, there may be popular pressure to regulate returns on innovation, even in cases where the economic rationale is slim. For example, pharmaceutical companies charge different prices in different markets for the

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same drug – a practice that is generally approved by economists on grounds of efficiency, but deeply offends the folks who end up paying more than the lowest price.

I can't provide the last word on why returns have been especially high in every case in which a firm is wildly successful. And I certainly can't answer the question of what returns should be allowed when equity concerns are in conflict with efficiency. But my research does suggest that, in many cases, high returns to investment in high technology represent the (rare) reward for taking very large risks, implying that limits on payoffs could deter innovation. And I offer two case studies in which efforts to contain profits have, in fact, had a chilling effect.

RETURNS TO INNOVATION: THE THEORY

Why do investors in innovative activities – for example, corporations choosing which internal projects to finance or venture capitalists screening business plans – select so many poor investments for every truly successful one financed? The answer really depends on the answers to two other questions. Why are the returns to high-tech innovation so highly skewed? And why is it so difficult for investors to identify the projects that will ultimately generate the bulk of the returns?

Since the late 1970s economists have developed a rich array of "racing" models to describe technological competition among companies. In their simplest form, where innovations are not large and are certain to be made by whoever spends the most on research and development, the models imply that the difference in outcome between successful and unsuccessful innovators will be large. The leaders generate all the profits, while rivals drop out or earn nothing. When the rewards are larger and the innovation more uncertain, new entrants may displace established companies. But again, we see a very uneven distribution of returns, where the new leader gains a disproportionate share of the profits.

Equally important, it is very difficult for investors to predict which companies will win the races because there are tremendous incentive and information problems associated with the financing of innovation. Early in a project cycle, information gaps between researchers and investors are commonplace. Investments in technology typically yield substantial intangible assets, which are difficult to value and may be impossible to resell if the project fails. Similarly, market conditions are highly variable.

By their very nature, then, efforts to innovate are associated with high levels of uncertainty and a wide dispersion of outcomes. In addition to questions about technical feasibility, there is typically uncertainty about the magnitude of the returns if the project is successful. Often, the extent of intellectual property protection that a new high-tech product will receive is also unclear.

Uncertainty affects the willingness of investors to contribute capital, the desire of suppliers to extend credit and the decisions of researchers and their managers. If managers are averse to taking risks, it may be difficult to induce them to make the right decisions. Conversely, if they are overly optimistic, they may spend money on projects that have little chance of success.

A second factor here, asymmetric information, is distinct from uncertainty. Thanks to day-to-day involvement with the project, a researcher knows more about its prospects

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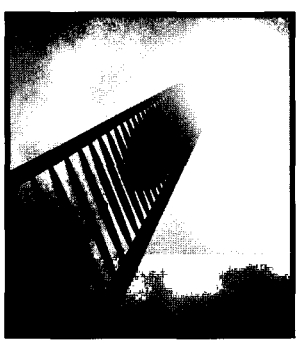
than investors, suppliers or strategic partners. And the consequences can be problematic. For example, the researcher may take detrimental actions that investors cannot observe – perhaps undertaking a riskier strategy than initially suggested or not working as hard as the investor expects. The entrepreneur might also invest in projects that build his reputation at the investors' expense.

Asymmetric information can also lead to selection problems. The scientist who makes a potentially important discovery may exploit the fact that he knows more about the project than his investors. Investors may find it difficult to distinguish between truly revolutionary technologies and impractical ones.

A third factor creating risk in high-tech investment is the nature of the assets. For many innovative projects, the primary assets are patents, trade secrets or informal "know-how." Traditional industries in which most assets are tangible – machines, buildings, inventory – may find financing easier to obtain.

Market conditions also play a key role in determining the difficulty of financing innovative projects. As the Internet bubble illustrated, both the supply of capital from public investors and the price at which this capital is available vary dramatically. These changes may be a response to regulatory edicts or to shifts in investors' perceptions of future profitability. As a result, investors may find that projects they have financed fail for reasons that are entirely unforeseen and have little to do with a company's behavior.



In many cases, high returns to investment in high technology represent the (rare) reward for taking very large risks, implying that limits on payoffs could deter innovation.

RETURNS TO INNOVATION: THE EVIDENCE

A variety of studies examine the returns from investments in innovation. Despite the varying measures employed and the different industries under study, the conclusions are consistent: the returns are remarkably skewed. Indeed, a small minority of projects generates the bulk of the profit.

Perhaps the finest level at which the returns to investments in innovative projects can be studied is at the patent level. Unfortunately, though, it is difficult to determine the outlays devoted to the development of a particular patent; analysts are typically confined to examining the distribution of patent valuations instead.

One way to infer the distribution of value in patents is from information about patent holders' willingness to go to the trouble and expense of renewing government protection. The most sophisticated research using this approach is by Jean Lanjouw (Yale). Her analysis implies that a modest fraction of patents

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account for a large share of the value of all patents in a host of industries. In patents relating to computer hardware, for example, the most valuable tenth account for 40 percent of the total value. In textile patents, the share of the top decile is 43 percent; in engines, 35 percent.

problem by examining the distribution of licensing revenues generated by universities. Universities are likely to license all patents of commercial value because they are unlikely to undertake development themselves. Using data on 576 licensed patents (or bundles of patents) from seven universities, the three researchers show that the top 10 percent of

If innovators did not receive any value from the top 5 percent of computer hardware patents, Lanjouw estimates that the average value of a patent would fall by more than one-quarter.

If innovators were not allowed to receive the full returns from the most valuable patents, the average value would tumble. For example, if innovators did not receive any value from the top 5 percent of computer hardware patents, Lanjouw estimates that the average value of a patent would fall by more than one-quarter.

An alternative measure of patent value is the royalty income from licensing. Unfortunately, licenses often cover large numbers of patents, making the observation of the returns from particular ones impossible. Furthermore, the patents that are licensed are often unrepresentative of all patents awarded to the corporation. For example, managers may be reluctant to license their most valuable patents because they believe the company will not be fairly compensated.

F.M. Scherer (Harvard), Dietmar Harhoff (Ludwig Maximilians University, Munich) and Joerg Kukies (Chicago) address this problem by examining the distribution of licensing revenues generated by universities. Universities are likely to license all patents of commercial value because they are unlikely to undertake development themselves. Using data on 576 licensed patents (or bundles of patents) from seven universities, the three researchers show that the top 10 percent of patents account for between 84 percent and 93 percent of the total revenues.

One of the inherent limitations with studies of patents is the difficulty in measuring the timing and magnitude of the research and development costs. This concern can be addressed by examining the returns from investments in companies specializing in innovation – privately held companies backed by venture capitalists and initial public offerings (IPOs) of high-technology companies.

More than 80 percent of venture capital investments have been in the information technology and life science fields, where a company's value is inexorably linked to product and process innovations. Venture capitalists expend much of their energy screening out proposals that are unlikely to be successful. Indeed, 100 to 200 proposals are rejected for every one financed. Financing is often conditional on extensive due diligence and the identification of another venture organi-

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zation that is willing to act as a co-investor.

Despite these efforts, the financial returns to venture investments are highly skewed. Blaine Huntsman (Olympus Bank, retired) and James P. Hoban (Ball State) reviewed 110 investments by three venture capital groups between 1960 and 1975. The return before deductions for management fees or incentive compensation for the venture capitalists was 18.9 percent. The distribution of the returns across particular transactions, however, was highly uneven.

Investors suffered complete losses in 17 percent of the 110 cases. Only one-quarter of the sample exceeded the average 4 percent return of the portfolio. If the nine top performers are removed, the rate of return of the entire portfolio falls from 18.9 percent to 7.6 percent. If the top 17 performers are removed, the return of the portfolio is negative.

These results appear to have changed little since the 1970s. Phillip Horsley (Horsley Bridge Associates, San Francisco) examined a crude measure of the return from 1,004 venture capital investments from 1985 to 1992. The total difference between their cost and value was $6.1 billion: the original investment was $2.8 billion, and the value as calculated was $8.9 billion. Of this $6.1 billion, the best 76 investments accounted for $3.5 billion, or more than one-half, of the total gains. Although this measure is cruder than that of Huntsman and Hoban, it certainly buttresses the conclusion that the extreme skewness of returns they observed in the earlier data still characterizes the venture capital industry.

An alternative measure is the performance of the IPOs of high-tech companies. Because many of these firms go public while they are still pursuing significant innovations, the stock returns should reflect the evolution of their innovative efforts. Scherer, Harhoff and Kukies found that the top 10 percent of the 110 venture-backed companies they studied that went public from January 1983 to December 1986 yielded 62 percent of the companies' combined value at the end of 1995.

Do these patterns hold for software, the icon of high tech investment? Using growth as a proxy for the change in value, I show that a very modest number of companies do, indeed, account for the bulk of the industry's success.

Ideally, I would have examined the evolution of market value in software companies. But only 5 percent of the 12,000 software enterprises in my database consist of standalone publicly traded companies. So I focused instead on two alternative measures that are highly correlated with market value: sales and employment growth.

My data are drawn from a survey of computer software companies from 1990 through 1998 that was compiled by Corporate Technology Information Services. This data set includes all software companies that CorpTech could identify, including those that were acquired or liquidated in the interval.

The companies are disproportionately located in California and Massachusetts. Most are quite young, with more than two-thirds having been founded after 1980. Just 896 of them had ever received venture capital financing; the remaining companies had been financed through cash flow, or from investments by corporations and individuals.

The data consist of annual observations of sales and employment of companies between 1990 and 1998. I computed the difference between each pair of adjoining years where I have sales or employment data: in all, there are over 37,000 such data points for employment and a little under 29,000 for sales.

I also compute the difference in employment and sales over the entire period in which the company remained in the database.

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These computations may be for periods as short as one year or as long as eight. In total, values can be computed for 10,300 companies for sales and 10,491 companies for employment.

Table 1 provides the mean and median of each measure of growth, as well as other breakpoints of the distribution. It highlights the fact that the growth of employment and sales are both highly skewed. For example, in the case of long-run employment, fully 85 percent of the companies were below the mean. Measured by employment or sales, the top few percent contributed the overwhelming amount of the growth. For example, the aggregate growth in employment between the first and last observation of the 10,491 companies in the sample was 413,000. But the growth of just the top 1 percent (105 companies) was just over 373,000 jobs.

TABLE 1: EMPLOYMENT AND SALES GROWTH FOR ALL SOFTWARE FIRMS 1990-98

EMPLOYMENT IN NUMBERS OF WORKERS. SALES IN MILLIONS OF 1997 DOLLARS.

	YEAR-TO-YEAR GROWTH		1990-1998 GROWTH	
	EMPLOYMENT	SALES	EMPLOYMENT	SALES
Average	9.3	1.8	39.3	4.7
Median	0	-0.05	0	-0.2
75th Percentile	1	-0.02	8	1.04
90th Percentile	15	2.7	60	8.92
95th Percentile	40	10.2	155	22.2
99th Percentile	256	74.2	910	178

These results establish that the returns to innovation are highly skewed, but don't prove that it is difficult to select successful companies in advance. It is possible, after all, that many of the losing companies were financed by unsophisticated investors.

To address this concern, I first examined the subset of companies financed by professional venture capitalists. As discussed earlier, venture capitalists engage in an extensive screening and due diligence before investing in new companies. Table 2 replicates Table 1, but presents the results for only the 896 venture-backed companies in the sample. Yet here, too, a few companies accounted for the vast bulk of the growth, implying that venture capitalists also don't know in advance which investments will pan out.

Another way to capture the difficulty of predicting success is through statistical regression analysis. I used as observations all companies that had employment data for at least two years in the CorpTech sample between 1990 and 1998. The estimated equations show the relationship between the growth in employment and (a) the age of the company at the time of the first observation, (b) employment in the year of the first observation, (c) the number of other software companies in the firm's state and ZIP code in the year of the first employment observation (to control for any regional agglomeration effects that may influence success), and (d) a "dummy" variable to distinguish venture capital-financed companies from others.

The regressions explain a mere 1 percent to 10 percent of the total variance in employment growth. Investors, of course, would use many other criteria in assessing the potential return to an investment in new software. But the poor fit of this regression does suggest how difficult it is to predict the success of companies in advance.

Venture capitalists appear to be better at selecting companies than other investors: employment in a typical venture-backed firm grows at a rate 14 percent greater than the

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other companies. Still, since the presence of venture expertise doesn't explain much of the variance in a company's outcomes, it is clear that they also face serious challenges in identifying successful companies.

IMPLICATIONS FOR PUBLIC POLICY

The wide distribution of returns from investment in innovation and the inability of even the most sophisticated investors to determine in advance which projects will succeed have profound implications. Private investors will undertake a risky investment only if they believe they will earn an attractive return. Yet regulation affecting the returns of investors in just a few successful companies can have a dramatic impact on the overall return to the portfolio. If even a small number of successful high-technology companies are not allowed to earn an attractive rate of return because of regulation after the fact, there may be a dramatic reduction in the willingness of investors to finance similar ventures in the future.

To illustrate the point, I offer two real-world cases. In each, regulation had a chilling effect on the willingness of private investors to invest in subsequent high-risk projects in that industry.

The Communications Satellite Corporation

Comsat was established in 1963 under the authorization of the Communications Satellite Act of 1962. Due to the risk inherent in the company's plan to create a network of communications satellites and to the intangible nature of its assets, the firm was unable to finance its activities by borrowing. Instead, it undertook an IPO in June 1964, raising $200 million in equity.

Comsat's initial operations were far more successful than originally anticipated. It established commercial satellite service in April 1965, two years ahead of schedule. The incidence of satellite failures during and after launch was considerably less than expected, and the technological progress with each generation of satellite more substantial. In only one month during its first decade of operation did a satellite failure cause a revenue loss for Comsat. This technological success was reflected in the rapid growth in both the company's revenues and its profits.

However, Comsat's financial success attracted the attention of regulators. Comsat's legal monopoly was subject to regulation by the FCC. And in March 1972, the commission initiated hearings to determine a fair rate of return.

During the hearings, the commission's staff concluded that the company had been charging excessive rates. It recommended that Comsat be forced to reduce rates and to make refunds for excess profits that it had earned in previous years. In particular, the staff urged the FCC to allow the company a return on

TABLE 2: EMPLOYMENT AND SALES GROWTH FOR VENTURE-BACKED SOFTWARE FIRMS 1990-98

EMPLOYMENT IN NUMBERS OF WORKERS. SALES IN MILLIONS OF 1997 DOLLARS.

	YEAR-TO-YEAR GROWTH		1990-1998 GROWTH	
	EMPLOYMENT	SALES	EMPLOYMENT	SALES
Average	23.4	6.0	101	22.4
Median	0	-0.12	10	0.07
75th Percentile	16	2.9	63	9.8
90th Percentile	64	15.1	196	34.6
95th Percentile	125	33.0	375	76.1
99th Percentile	425	162	2,250	392

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equity of 8 percent over the previous decade. The recommended rate was slightly below that allowed the telecom giant AT&T.

Comsat argued that the technological and business risks it had faced were far greater than those of AT&T, which had an installed network and stable customer base. As compensation for these risks, it demanded a return between 12 percent and 15 percent. In response, the FCC staff argued Comsat's quick success was evidence that the risks were actually quite modest.

The commissioners bought the staff's arguments, ruling in 1975 that Comsat had exaggerated the risks. It allowed the company a rate of return on capital of 9.5 percent, a slight premium to that of AT&T. The decision stated that Comsat's investors "knew or should have known" that this would be the allowed rate of return when they invested in the firm. The FCC also sharply reduced the base on which Comsat could calculate its profits. Comsat appealed, but was ultimately forced to cut rates by nearly one-half.

During the year of the FCC's decision Comsat's stock price fell by nearly one-half. In the 10-day window around the FCC's decision, its share price fell by 30 percent. And the impact on Comsat was long-lasting: between 1964 and 1990, a period during which the Ibbotson large-capitalization stock market index appreciated by more than 1,300 percent, investors in Comsat experienced a negative return.

These negative consequences apparently extended well beyond Comsat's investors. There was very little new private investment in the space-related industries until the creation of the Orbital Sciences Corporation in 1983 (shortly after the dramatic rollback in regulation initiated by the Reagan administration). Not until the 1990s did investors again feel sufficiently comfortable to undertake large-scale investments in satellite communications. Although this renewal of investor interest in part reflected shifts in demand and technological opportunity, concern about regulation after a company became successful was clearly also a major consideration.

The Genzyme Corporation

The biotechnology industry began in the mid-1970s with the promise of rapidly exploiting new discoveries in genetic engineering. A major focus of the approximately 1,500 companies that entered the industry – including at least 350 that received venture capital backing – was the development of new pharmaceuticals.

This proved to be much more difficult than originally foreseen. Only 22 biotechnology-based therapeutics and vaccines were approved between 1975 and 1993. In 1993, the industry as a whole lost $3.6 billion.

The development of new drugs also proved to be extraordinarily expensive. Amgen, for example, had raised $405 million in equity before its first drug reached the market. And during the debate over reform of the health care system (1992-94), the prices of biotechnology drugs were subject to special scrutiny.

Some argued that Washington should enforce provisions that allow it to limit the prices of drugs derived from federally funded research. Since virtually all biotechnology-derived new drugs were based on federal research, this posed a substantial concern to the industry and its investors.

The focus of much of this controversy was the Genzyme Corporation, one of the relatively few companies to bring to market a bioengineered drug. Genzyme was founded in 1981 and received venture capital backing in

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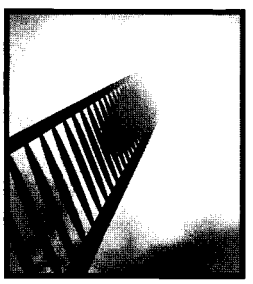
1983. After several false starts, it succeeded in obtaining FDA approval in 1991 to use the enzyme Ceredase for the treatment of Gaucher's disease. The company said that it had invested $70 million in researching and obtaining approval for the drug, for which it believed there were between 5,000 to 6,000 sufferers worldwide whose symptoms were serious enough to merit treatment with Ceredase.



The price of punishing success through direct controls on prices or indirect controls on price discrimination could be mediocrity and stagnation.

Genzyme's pricing of Ceredase, which put the annual cost of treatment for the typical patient by $20,000 to $350,000, was highly controversial. In October 1992, the United States Office of Technology Assessment criticized the drug's price, noting that the National Institutes of Health had financed much of the original research. One patient activist characterized it as "one of the worst illustrations of corporate greed I've ever seen."

In response, Genzyme cut the price of Ceredase. Like other biotechnology companies, it experienced negative returns during this period of scrutiny, with its market capitalization falling by more than one-half between the beginning of 1992 and the end of 1993.

More generally, the impact on young biotech companies was severe. The amount raised by publicly traded biotechnology companies in initial and follow-on offerings slipped from $4.2 billion in 1991 to $2.2 billion in 1992, and reached a nadir of $1.1 billion in 1994. The number of biotechnology companies attracting venture financing for the first time fell from 46 in 1992 to 20 in 1995. Equity valuations for publicly traded biotech stocks fell by 33 percent in 1993, a year in which the market as a whole rose. Wall Street attributed the rapid falloff in investment and valuations to concerns about the ability of biotechnology investors to earn sufficient returns from companies with approved drugs to compensate them for the many unsuccessful projects and companies.

THE BOTTOM LINE

New Economy industries – those that create and mobilize intellectual capital – are arguably the great hope for mature economies, where the prospects for old-fashioned bricks-and-mortar growth are waning. But they also represent a challenge to policymakers who aim to nurture the New Economy in the absence of a consensus on the sorts of regulation needed and in the teeth of public skepticism about the roots of corporate success.

To the point here, all the research points toward the need to restrain populist hostility toward big rewards for big risk takers. The price of punishing success through direct controls on prices or indirect controls on price discrimination could be mediocrity and stagnation. M

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Where has all the Money Gone?

Winners and Losers in the 1980s and 1990s

by
Edward N. Wolff

Until the recession scare, the media were aglow with reports of the booming economy and rising prosperity. Indeed, the 150 percent runup in the S&P 500 stock index between 1995 and the end of 1999 created the impression that virtually all Americans were doing well in terms of both income and wealth. But that is certainly not the case. Most families have seen their net worth stagnate over the last decade.

Apart from the obvious questions this raises about social justice, the wealth of middle-Americans is an important issue because financial liquidity allows families to weather sharp drops in income caused by job loss, divorce or illness. The failure of a large portion of the population to accumulate any meaningful savings thus increases the fragility of the middle class.

I focus on marketable wealth, or net worth (the current value of all marketable assets less debts) because it best reflects the level of

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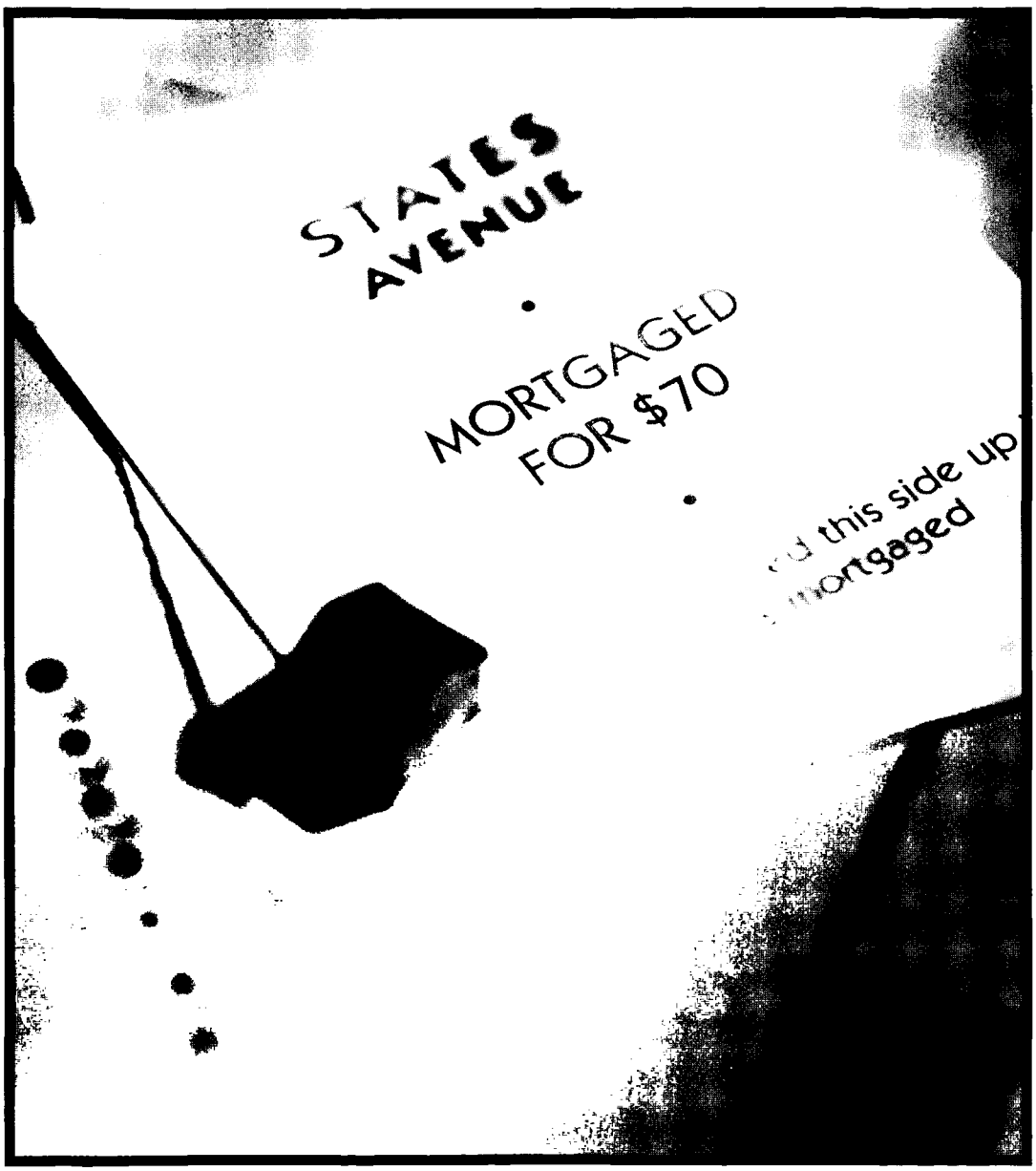

KEN BURRIS (ALL)

well-being associated with a family's holdings. Only assets that can be readily converted to cash are included. Consumer durables like cars and some forms of retirement wealth are excluded here. But there is no reason to believe that their inclusion would materially alter the picture.

The data are drawn from the Federal Reserve's Survey of Consumer Finances. Each survey consists of a core representative sample combined with a high-income supplement, which is drawn from the Internal Revenue Service's Statistics of Income data file. Though other data are available for analyzing

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household wealth, the Fed's survey is the best for capturing both the wealth at the top of the distribution and the complete wealth portfolio of households in the middle.

MEAN VERSUS MEDIAN SINCE 1983

After rising by 7 percent between 1983 (the end of the last serious recession) and 1989, the wealth of the households in the middle of the distribution was only 4 percent greater in 1998 than in 1989. One reason for this slow growth in median wealth is that the percentage of households with zero or negative net worth increased from 15.5 percent in 1983 to 18.0 percent in 1998. The percentages of households with net worth of less than $5,000 and less than $10,000 (in 1998 dollars) also rose.

Average wealth is much higher than the median – $270,000 compared to $61,000 in 1998. This implies that the bulk of household wealth is concentrated in the richest families. Mean wealth rose by a solid 15 percent from 1983 to 1989. Between 1989 and 1998, it rose by a more moderate 11 percent. But that figure is still substantially higher than the corresponding gain in the middle of the wealth distribution. Note, in particular, that between 1995 and 1998, rising stock prices drove up average wealth by a remarkable 24 percent.

Median household income grew by a robust 11 percent between 1983 and 1989. However, it virtually stagnated from 1989 to 1998, inching up by a mere 2.3 percent. Mean income, on the other hand, rose by 16 percent from 1983 to 1989, and another 8 percent between 1989 and 1998.

In sum, the results point to a striking contradiction: living conditions stagnated in the 1990s for American households in the middle, while rapid advances in wealth and income for the elite briskly pulled up the averages.

AVERAGE AND MEDIAN WEALTH AND INCOME, 1983-1998
(IN THOUSANDS, 1998 DOLLARS)

						PERCENT CHANGE		
	1983	1989	1992	1995	1998	1983-89	1989-98	1983-98
A. NET WORTH								
1. Median	54.6	58.4	49.9	48.8	60.7	7.0%	3.8%	11.1%
2. Mean	212.6	243.6	236.8	218.8	270.3	14.6%	11.0%	27.1%
3. Percent with net worth								
a. Zero or negative	15.5%	17.9%	18.0%	18.5%	18.0%			
b. Less Than $5,000*	25.4%	27.6%	27.2%	27.8%	27.2%			
c. Less Than $10,000*	29.7%	31.8%	31.2%	31.9%	30.3%			
B. INCOME								
1. Median	34.2	38.0	35.6	36.4	38.9	11.2%	2.3%	13.8%
2. Mean	41.6	48.0	45.1	48.1	51.9	15.5%	8.0%	24.7%

* Constant 1998 Dollars.

SOURCE: Own computations from the 1983, 1989, 1992, 1995 and 1998 Surveys of Consumer Finances; Current Population survey.

WEALTH CONCENTRATION SINCE 1983

Wealth distribution calculations for 1998 indicate a remarkable degree of concentration. The top 1 percent of families (as ranked by marketable wealth) owned 38 percent of total household wealth, and the top 20 percent of households held 83 percent. But changes in concentration are striking; after rising steeply between 1983 and 1989, inequality increased at a much slower pace from 1989 to 1998. The share of wealth held by the top 1 percent rose by 3.6 percentage points from 1983 to 1989 and by a more moderate 0.7 percentage points between 1989 and 1998. Similar patterns are evident for the shares of the

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SIZE DISTRIBUTION OF WEALTH, 1983-1998 (PERCENT OF TOTAL)

YEAR	SHARE OF TOP 1%	SHARE OF TOP 5%	SHARE OF TOP 10%
1983	33.8%	56.1%	68.2%
1989	37.4	58.9	70.6
1992	37.2	60.0	71.8
1995	38.5	60.3	71.8
1998	38.1	59.4	71.0

SOURCE: Own computations from the 1983, 1989, 1992, 1995 and 1998 Surveys of Consumer Finances.

top 5 and 10 percent.

Over the 1983 to 1998 period, the top 1 percent saw their average wealth rise by $3 million – a whopping 42 percent. Meanwhile, the poorest 40 percent lost 76 percent of their (very modest) wealth.

Another way to view this phenomenon is to look at the proportion of the total increase in household wealth between 1983 and 1998 accruing to different groups in the distribution. This is computed by dividing the increase in total wealth of each group by the total increase in household wealth. However, as apologists for the status quo are quick to point out, the households found in a slice of the wealth distribution (say, the top quintile) vary across time. Thus, while wealth became more concentrated, the social consequences were, in part, offset by the possibility of upward mobility.

That said, the results are still unsettling. The richest 1 percent accumulated 53 percent of the total gain in marketable wealth over the 1983-1998 period. The next 19 percent received another 39 percent, so that the top quintile accounted for 91 percent of the total growth in wealth, while the bottom 80 percent accounted for a mere 9 percent.

Despite the apparently modest increase in wealth inequality during the 1990s, the decade witnessed a near explosion in the number of very rich households. The number of millionaires climbed by 54 percent between 1989 and 1998, while the number of penta-millionaires ($5 million) more than doubled and the number of deca-millionaires ($10 million) almost quadrupled. Much of the growth occurred between 1995 and 1998, and was directly related to the surge in stock prices.

These results indicate rather dramatically that the fruits from economic growth in the last few decades were enjoyed by a surprisingly small part of the population – the top 20 percent, and particularly the richest 1 percent.

MEAN NET WORTH BY WEALTH CLASS, 1983-1998
(IN THOUSANDS, 1998 DOLLARS)

	TOP 1%	NEXT 4%	NEXT 5%	NEXT 10%	NEXT 20%	MIDDLE 20%	BOTTOM 40%	ALL
1983	7,175	1,187	516.2	278.7	133.6	55.5	4.7	212.6
1998	10,204	1,441	623.5	344.9	161.3	61.0	1.1	270.3
% change	42.2%	21.4%	20.8%	23.7%	20.7%	10.0%	-76.3%	27.1%
% of gain	52.5%	17.7%	9.3%	11.5%	9.6%	1.9%	-2.5%	100.0%

SOURCE: Own computations from the 1983, 1989, 1992, 1995 and 1998 Surveys of Consumer Finances.

THE NUMBER OF MULTI-MILLIONAIRES, 1983-1998
(NUMBER OF HOUSEHOLDS, IN THOUSANDS)

YEAR	TOTAL NUMBER OF HOUSEHOLDS	WORTH $1,000,000 OR MORE	WORTH $5,000,000 OR MORE	WORTH $10,000,000 OR MORE
1983	83,893	2,411	247.0	66.5
1989	93,009	3,024	296.6	64.9
1992	95,462	3,104	277.4	41.6
1995	99,101	3,015	474.1	190.4
1998	102,547	4,783	755.5	239.4

THE COMPOSITION OF HOUSEHOLD WEALTH

Further evidence of the changing financial condition of American families can be seen in

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the composition of their wealth. In 1998, owner-occupied housing was the most important household asset, accounting for 29 percent of total assets. Real estate other than owner-occupied housing comprised 10 percent, and equity in privately held businesses another 18 percent. Liquid assets made up 10 percent; retirement accounts amounted to 12 percent. Securities and trust equity added up to 20 percent. Total household debt was 18 percent the size of household net worth.

COMPOSITION OF TOTAL HOUSEHOLD WEALTH, 1983 AND 1998
(PERCENT OF GROSS ASSETS)

COMPONENT	1983	1998
Principal residence	30.1%	29.0%
Other real estate	14.9	10.0
Liquid assets*	17.4	9.6
Financial securities	4.2	1.8
Corporate stock and mutual funds	9.0	14.8
Business equity	18.8	17.7
Personal trusts	2.6	3.8
Pension accounts	1.5	11.6
Miscellaneous assets	1.3	1.8
Total	100.0	100.0
Debt on principal residence	6.3	10.7
All other debt	6.8	4.2
Total debt	13.1	15.0
RATIOS	**1983**	**1998**
Debt / equity ratio	15.1	17.6
Principal residence debt / house value	20.9	37.0
Net home equity / total assets	23.8	18.2
All stocks / total assets	11.3	22.6

* Checking accounts, savings accounts, time deposits, money market funds, certificates of deposits, and the cash surrender value of life insurance.

SOURCE: Own computations from the 1983 and 1998 Surveys of Consumer Finances.

There have been some significant changes since 1983. The most disturbing trend is the rising indebtedness of American families, with the household debt as a percentage of household equity climbing from 15 percent to 18 percent. Moreover, as noted earlier, the portion of households recording zero or negative net worth grew from 15.5 percent in 1983 to 18.0 percent in 1998.

Contrary to popular wisdom, the principal source of these increases is not rising consumer debt – credit card balances and the like. In fact, consumer debt fell from 6.8 percent to 4.2 percent of total household assets from 1983 to 1998. Rather, the culprit is rising mortgage debt, including home equity loans and second mortgages, which climbed from 6 percent to 11 percent of total assets. Indeed, mortgage debt as a share of the value of homeowners' property increased from 21 percent to 37 percent. Whereas the total market value of homes remained almost constant as a share of total assets over this period, net home equity – the value of houses minus outstanding mortgages – plummeted from 24 percent to 18 percent of total assets.

A second notable change is that self-directed retirement accounts rose from 1.5 percent to 11.6 percent of total assets between 1983 and 1998. However, this increase almost exactly offset the decline in liquid assets, from 17.5 percent to 9.6 percent. Indeed, the explosion in the use of various types of tax deferred retirement accounts – IRAs, 401(k) plans, and other thrift plans – apparently did not increase overall family savings. It merely allowed households to defer tax on what they save.

A third important change is the sharp rise in the share of corporate equities in total assets, from 9.0 percent to 14.8 percent, reflecting the bull market in stocks. Moreover, these figures do not reflect the full extent of the growth in stock holdings, because stocks are also indirectly held in mutual funds, retirement accounts, and trust funds. If we include stocks owned both directly and indirectly by households, their share of total wealth doubled from 11.3 percent to 22.6 percent.

There are marked differences in how mid-

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dle-class families and the rich invest their wealth. The richest 1 percent of households held almost 80 percent of their savings in investment real estate, businesses, corporate stock and financial securities in 1998. Housing accounted for only 8 percent of their wealth, liquid assets for another 5 percent, and retirement accounts for 7 percent. For this elite group, total debt was just 3 percent as large as net worth.

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WINNERS AND LOSERS

In contrast, 60 percent of the wealth of the middle three quintiles of households in 1998 was in their own homes. Another 24 percent was in pension accounts and liquid savings of one form or another. Together, housing, liquid assets, and pension assets accounted for 84 percent of the total assets of the middle class. The remainder was about evenly split among non-home real estate, business equity, and various financial securities. Stocks owned directly or indirectly amounted to only 11 percent of their total assets. Debt represented 51 percent of net worth. Note that this percentage for middle class households rose from 37 percent in 1983 to 51 percent in 1998. Middle class households, it appears, were spending down their net worth to maintain their living standards.

COMPOSITION OF HOUSEHOLD WEALTH BY WEALTH CLASS, 1998
(PERCENT OF GROSS ASSETS)

COMPONENT	TOP 1 PERCENT	MIDDLE 3 QUINTILES
Principal residence	7.8%	59.8%
Liquid assets	5.0	11.8
Pension accounts	6.9	12.3
Corporate stock, financial securities, mutual funds and personal trusts	31.6	5.5
Business equity and other real estate	46.9	8.8
Miscellaneous assets	1.8	1.8
Total assets	100.0	100.0
RATIOS		
Debt / equity ratio	3.3	51.3
Debt / income ratio	49.4	101.6
All stocks / total assets	28.7	11.2

Top 1 percent: Net worth of $3,352,000 or more.
Quintiles 2 through 4: Net worth between $263 and $258,00.

SOURCE: Own computations from the 1998 Survey of Consumer Finances.

Home ownership rose by three percentage points between 1983 and 1998, from 63.4 percent to 66.3 percent. This may seem like a significant change. However, between 1950 and 1975, the home ownership rate increased by almost 10 percentage points (from 55.0 percent to 64.6 percent) and then fell back to 63.5 percent in 1985. Thus, the home ownership rate has barely budged over the last quarter century, gaining less than two percentage points from 1975 to 1998. That compares to an almost 10 percentage point gain over the previous quarter century.

There have been widespread reports that stock ownership has substantially widened in the United States, particularly during the 1990s. Indeed, the proportion of households that own some stock either outright or indirectly through mutual funds, trusts or retirement accounts increased from 24.4 percent in 1983 to 48.2 percent in 1998. Thus, more than 100 percent of the increase was fueled by the growth in IRAs, Keogh plans and 401(k) plans. That is, direct stock ownership actually declined somewhat (from 13.7 percent to 13.1 percent) – likely a result of the 1987 stock market plunge and the transfer of existing savings from taxable to tax-deferred accounts.

But despite the overall gains in stock ownership, less than half of all households had any stake in the stock market in 1998. Moreover, many of the households that did own stocks had only a minor stake in the market. While 48 percent of households owned some stock in 1998, only 36 percent had total holdings worth at least $5,000 and less than a third owned at least $10,000 in stock.

Though the attention of the media has focused largely on stocks, the ownership of small, unincorporated businesses comprises a larger component of household wealth. While stock ownership has increased among the American population, small-business ownership has become more concentrated; households owning business fell from 14.2 percent in 1983 to 11.4 percent in 1998. In

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part, this reflects the consolidation of farms in America.

Small-business ownership is much higher among the richest 1 percent of households; at least two-thirds of households in this group owned their own businesses. By contrast, only 9 percent of households in the middle three quintiles owned a business.

Another way to portray differences between middle class households and the rich is to compute the share of total assets of different types held by each group. In 1998, the richest 1 percent of households held half of all outstanding securities and trust equity, two-

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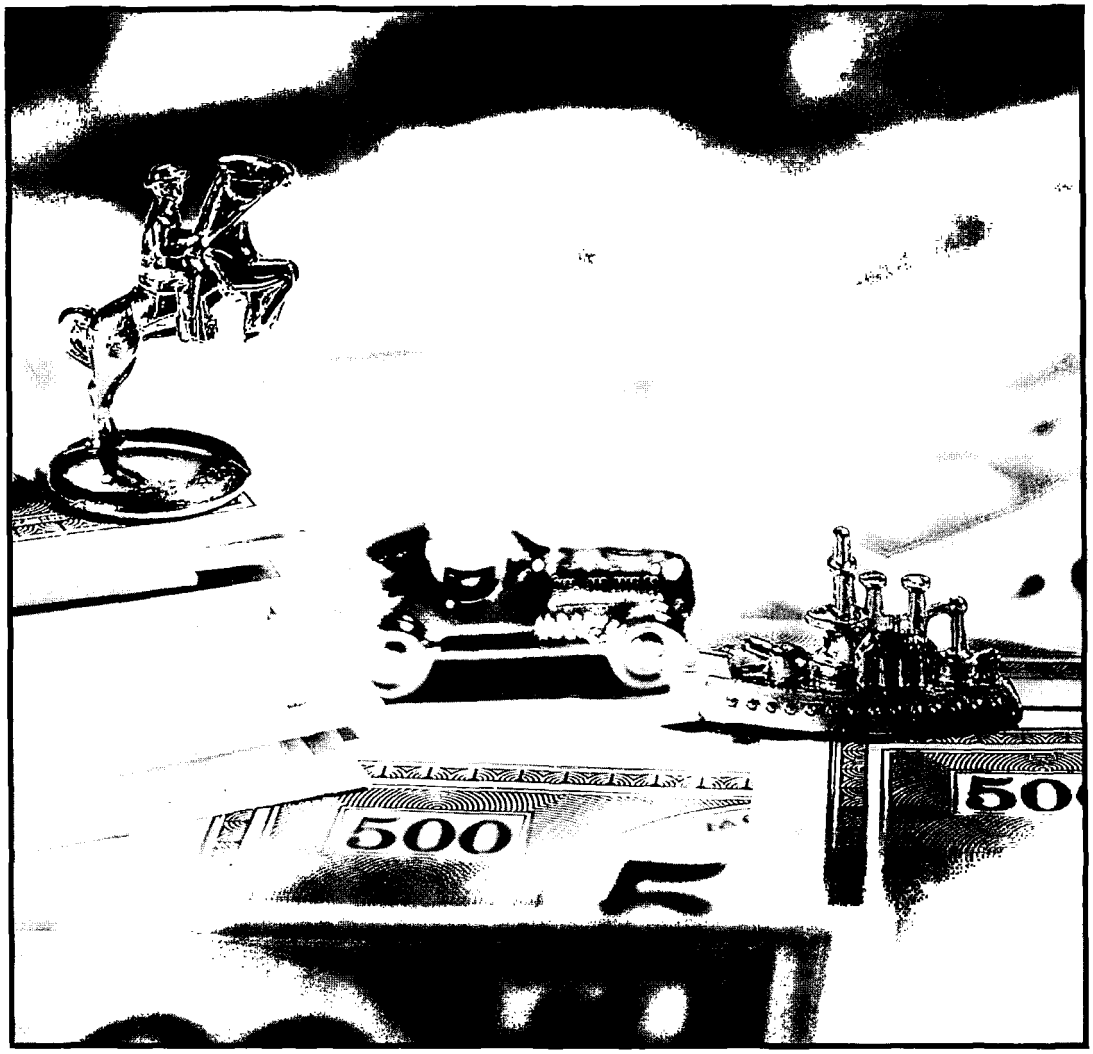

thirds of private business equity, and 36 percent of investment real estate. The top 10 percent of families accounted for about 90 percent of stock, bonds, trusts and business equity, and about three-quarters of nonhome real estate. Indeed, despite the spread of stock ownership among the American population during the 1990s, stock wealth remains almost as concentrated at the end of the 1990s as it was at the beginning. The top 10 percent owned 79 percent of stock in 1998, down a tad from 81 percent in 1989.

In contrast, owner-occupied housing, bank deposits, life insurance and pension accounts were more evenly distributed among households. The bottom 90 percent of households accounted for about two-thirds of the value of owner-occupied housing, almost 50 percent of deposits and life insurance cash value, and 40 percent of the value of pension accounts. Debt was the most evenly distributed component of household wealth, with the bottom 90 percent of households responsible for 73 percent of total indebtedness.

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WHO GAINED MOST FROM THE 1990s BOOM?

My core results are worth repeating: more than half of the gains in wealth from 1983 to 1998 accrued to the top 1 percent of households, and more than 90 percent went to the top 20 percent. The number of millionaires doubled from 1983 to 1998, and the number of deca-millionaires quadrupled, with most of the growth in their ranks occurring after 1989.

The new figures also point to the growing indebtedness of the American family, with debt as a percentage of household wealth rising from 15 percent in 1983 to 18 percent in 1998. And households reporting zero or negative net worth jumped from 15.5 percent in 1983 to 18.0 percent in 1998. Net equity in owner-occupied housing as a share of total assets fell sharply, reflecting rising mortgage debt on homeowners' property.

Since the early 1980s, households have shifted their assets toward corporate stocks, a change accentuated by the surge in stock prices in the late 1990s. Yet despite this growth in stock holdings, less than a third of households own stock worth more than $10,000. Stock shares still remain heavily concentrated, with the richest 10 percent accounting for 79 percent of the total value of these stocks in 1998.

Other investment assets are also extremely concentrated. Two-thirds of households in the top 1 percent owned a business in 1998, compared to 11 percent of the overall population. The richest 10 percent accounted for 92 percent of the value of these businesses.

The main asset held by middle class families is still a house, comprising 60 percent of their gross assets. Yet, home ownership has grown very slowly over the last quarter century, rising by less than 2 percentage points between 1975 and 1998 – in contrast to an almost 10 percentage point gain from 1950 to 1975.

Thus, whether we think in terms of income or wealth, the boom of the 1990s has bypassed most Americans. The rich have been the main beneficiaries. M

THE PERCENT OF TOTAL ASSETS HELD BY WEALTH CLASS, 1998

ASSET TYPE	1983	1989	1992	1995	1998
A. HOMEOWNERSHIP RATE	63.4%	62.8%	64.1%	64.7%	66.3%
B. STOCK HOLDINGS					
Direct stock holdings only	13.7	13.1	14.8	15.2	19.2
Any stock holdings*	24.4	31.7	37.2	40.4	48.2
Stock worth $5,000 or more**	14.5	22.6	27.3	29.5	36.3
Stock worth $10,000 or more**	10.8	18.5	21.8	23.9	31.8
C. SMALL BUSINESS OWNERSHIP					
All households	14.2	11.5	13.1	11.1	11.4
Top 1 percent	82.1	67.0	70.6	71.8	67.3

* Includes direct ownership of stock shares and indirect ownership through mutual funds, trusts, and IRAs, Keogh plans, 401(k) plans and other retirement accounts.

** 1998 dollars

SOURCE: Own computations from the 1983, 1989, 1992, 1995 and 1998 Surveys of Consumer Finances.

TRENDS IN ASSET OWNERSHIP RATES, 1983-1998

(PERCENT OF HOUSEHOLDS HOLDING THE ASSETS)

ASSET TYPE	TOP 1%	NEXT 9%	BOTTOM 90%	ALL
A. INVESTMENT ASSETS				
Stocks and mutual funds	49.4%	35.7%	14.9%	100.0%
Financial securities	50.8	33.2	15.9	100.0
Trusts	54.0	36.8	9.2	100.0
Business equity	67.7	24.0	8.3	100.0
Non-home real estate	35.8	39.1	25.1	100.0
Total for group	54.1	32.1	13.8	100.0
Stocks, directly or indirectly owned*	42.1	36.6	21.3	100.0
B. HOUSING, LIQUID ASSETS, PENSION ASSETS AND DEBT				
Principal residence	9.0	26.2	64.8	100.0
Liquid assets**	19.5	31.5	49.0	100.0
Pension accounts	19.7	40.2	40.2	100.0
Total for group	13.0	31.0	56.0	100.0
Total debt	7.1	19.9	73.0	100.0

Top 1 percent: Net worth of $3,352,100 or more.

Next 9 percent: Net worth between $475,600 and $3,352,100.

Bottom 90 Percent: Net worth less than $475,600.

* Includes direct ownership of stock shares and indirect ownership through mutual funds, trusts, and IRAs, Keogh plans, 401(k) plans and other retirement accounts

** Checking accounts, savings accounts, time deposits, money market funds, certificates of deposits, and the cash surrender value of life insurance.

SOURCE: Own computations from the 1998 Survey of Consumer Finances.

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THE BUSH

On June 7, George W. Bush signed into law a tax cut that had been a defining feature of his presidential campaign. Although the new law is not a photocopy of his original plan, it is sufficiently close to allow the president to claim victory and put his stamp on the largest tax cut since 1981.

Yet, the victory raised as many questions as it resolved. This, after all, was a tax-cut bill submitted even before the president offered a budget to go along with it. At an operational level, many of the tax-law changes are just plain odd. Different provisions phase in and phase out in different years in a seemingly random fashion, and the entire tax cut sunsets in 2011. This will make tax planning difficult and create uncertainty about the evolution of tax policy, undermining the positive incentive effects associated with the cut in marginal tax rates.

Equally problematic, the magnitude and structure of the tax cut were never well justified, and many of the administration's claims about its plan were misleading at best. Even those who wholeheartedly supported the tax cut have expressed dismay at the manner in which it was lobbied for and passed.

THE MORNING

by William Gale, Samara Potter and Emily Tang

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A FIRST LOOK

The most novel aspect of the new law is the sunset provision. Come Jan. 1, 2011, the tax code reverts to what it would have been had the bill never passed. The only underlying rationale: finessing budget procedures that would have made it impossible to reconcile the tax cut with the last Congressional budget resolution. Before the sunset, the tax law will, among other things, accomplish the following:

Reduce income tax rates. The 28, 31 and 36 percent tax brackets (which apply to married households with taxable income above $45,200, $109,250 and $166,500, respectively), will each fall by 3 percentage points, and the 39.6 percent top rate (which applies to married households with taxable income above $297,350), will fall by 4.6 percentage points. Each of these rates declined by 1 percentage point as of July 1, and will drop by a second point in 2004. The reductions are completed in 2006.

Create a new 10 percent income tax bracket. A new 10 percent bracket is created for the first $6,000 of taxable income for singles and the first $12,000 for married couples. This income is currently taxed at 15 percent.

Eliminate the estate tax. The exemption in the estate tax is raised from $675,000 currently to $1 million in 2002, and then gradually to $3.5 million in 2009. The top marginal tax rate is reduced from 60 percent to 50 percent in 2002, and then gradually to 45 percent in 2009. The federal credit for state estate taxes is gradually phased out between 2002 and 2005, after which it is replaced by a deduction. (This shift, in effect, forces the states that have inheritance taxes to pay for about one-quarter of the estate-tax cut.) In 2010, the estate and generation-skipping transfer taxes are repealed, the highest gift tax rate is set equal to the top individual income tax rate, and the step-up in basis for inherited assets that have capital gains is repealed.

Increase and expand eligibility for the child credit. The child credit is gradually increased from $500 to $1,000 by 2010. It is also made refundable to the extent of 10 percent of a taxpayer's earned income above $10,000 from 2001 to 2004 and 15 percent in subsequent years, with the $10,000 figure indexed for inflation. Refundability helps low-earnings households with little or no income tax liability, but who do pay other federal taxes.

TIMOTHY COOK

AFTER

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THE TAX CUT

Partially address the marriage penalty. The standard deduction for married couples gradually rises from 174 percent to 200 percent of the standard deduction for singles over five years, starting in 2005. The income taxed in the 15 percent bracket for married couples gradually rises from 180 percent to 200 percent of the similar level for singles over four years, also starting in 2005.

Liberalize pension and IRA incentives. The major changes include an increase in the contribution limits for Individual Retirement Accounts and Roth IRAs to $5,000 by 2008 and a gradual rise in contribution limits to 401(k) and similar plans to $15,000 in 2006. Additional catch-up contributions of up to $5,000 for anyone over the age of 50 will be permitted, while a nonrefundable credit for retirement saving for low-income taxpayers will be available between 2002 and 2006.

Liberalize education incentives. Taxpayers may deduct some higher education expenses, but only between 2002 and 2005. Effective in 2002, the contribution limit on education IRAs rises to $2,000 from $500. Prepaid tuition programs will now benefit from tax-free withdrawals as long as the funds are used for education, while deductions for student loan interest are made more generous.

Provide limited relief from the alternative minimum tax. Between 2001 and 2004, the exemption in the alternative minimum tax is increased by $2,000 for single taxpayers and $4,000 for married taxpayers – and then reverts to current law.

The reduction in tax revenue from these changes is estimated at $1.275 trillion over 10 years. But since the bill also provides cuts in 2001, the total reduction in revenue is about $1.35 trillion. The effect of the tax cut on the surplus is determined not just by the tax cut, but also by the added federal interest payments required because federal debt is higher than it otherwise would be. That puts the cost at $1.67 trillion through 2011, if the sunset holds. If all the phased-out provisions were extended, the cost would exceed $2 trillion.

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TAX CUTS AND THE BUDGET

The central justification for a large tax cut came from the view that the government was running a large surplus. But that is putting the cart before the horse. Yes, in January the Congressional Budget Office estimated a cumulative baseline surplus of $5.6 trillion for 2002 through 2011. But that figure is a poor guide to policy choices, for several reasons. First, the baseline uses cash-flow accounting, which includes trust fund accumulations for Social Security, Medicare and government pensions, but ignores their accruing liabilities – the money owed to future retirees. Second, the spending and tax-revenue projections are unrealistic. Third, the baseline ignores the uncertainty inherent in fiscal projections. Fourth, the 10-year horizon is terribly misleading with respect to the future of Medicare and Social Security and the fiscal status of the government.

Adjusting the 10-year baseline

Much of the projected 10-year budget surplus is driven by Social Security's $2.5 trillion surplus over the next decade. In the 1990s, Washington agreed that balances in the Social Security trust fund should not be used to finance tax cuts or other spending programs – if for no other reason than the reality that unrecorded liabilities far outstrip the cash flow.

Medicare pays for health care for the elderly. Part A, which covers hospital insurance

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and is financed by payroll taxes, is similar in structure to Social Security. Over the next 10 years, the Medicare trust fund for Part A is projected to run surpluses totaling $392 billion. Although Medicare is officially part of the on-budget surplus, Congress has voted repeatedly to protect the trust fund from other uses.

Pension reserves for federal military and civilian employees are projected to accrue surpluses of $419 billion over the next 10 years. Under current law, these surpluses remain on-budget. Like Social Security and Medicare, however, the money is earmarked to provide future benefits. Thus, the same economic logic that led Congress to protect Social Security and Medicare balances implies that government pension reserves should be protected as well.

The CBO's baseline only measures the implications of maintaining current policy. Thus one should not confuse the budget office's baseline with a forecast of what is likely. Forecasts of discretionary spending pose especially thorny problems. Unlike mandatory spending, allocations for defense, education, the environment, and the like require annual appropriations. The budget office simply assumes that real discretionary spending will remain constant at fiscal year 2001 levels. That's unreasonable. Discretionary spending totaled 6.3 percent of GDP in 2000. Under the Congressional Budget Office's 10-year baseline forecast, it will fall to 5.1 percent of GDP. That is, it would fall by one-fifth relative to the size of the economy and by one-tenth in per capita terms. It would be more plausible to project real discretionary spending growth at the same rate as the population. Tweaking the baseline this way would raise discretionary spending by $359 billion and, counting the added interest on federal debt, would reduce available surpluses by about $418 billion. Assuming that discretionary spending will grow at the same rate as GDP would raise spending by $905 billion and reduce the available surplus by $1.05 trillion.

Note, too, that baseline revenues are likely to fall short for two reasons. First, the forecast assumes expiring tax subsidies will expire. Second, the alternative minimum tax is unlikely to survive in its current form. Although it was created to punish a small number of wealthy tax avoiders, a combination of inflation and lower tax rates will make it applicable to some 20 million taxpayers in 2011! Current policy would be better represented by indexing the AMT for inflation – which reduces the projected surplus by another $130 billion.

EFFECTS OF TAX CUTS AND OTHER POLICIES ON PROJECTED BUDGET SURPLUSES FOR 2002-2011

($ BILLIONS)

	2002-06	2007-11	2002-11
CBO May 2001 Baseline	**2,002**	**3,626**	**5,628**
Social Security*	1,020	1,465	2,485
Medicare	200	192	392
Remaining Surplus	**782**	**1,969**	**2,751**
Economic Growth and Tax Relief Reconciliation Act	479	796	1,275
Additional Interest Payments Due to Tax Cut	72	255	327
Remaining Surplus	**232**	**918**	**1,149**
Additional Spending in Budget Resolution (and interest)	191	409	600
Extended Tax Cuts (and interest)**	53	470	523
Defense Spending not in Budget Resolution (and interest)	97	174	271
Education Spending not in Budget Resolution (and interest)	53	130	183
Remaining Surplus* **	**-162**	**-265**	**-427**

* This is technically an adjustment for the whole off-budget surplus, virtually all of which is due to the Social Security Trust Fund.

** The "extended" tax cut assumes that all phased-out or sunsetting provisions of EGTRRA are extended through 2011, including AMT relief, and assumes that other expiring provisions in the tax law are extended through 2011.

*** Note that this figure (a) does not include the costs of any new major weapons system acquisition or missile defense program, or any emergency spending in the future, (b) has not adjusted for the surplus in government pension funds, (c) has not adjusted for the projection that about 20 million taxpayers will be on the AMT in 2011, even if the extended tax cut is implemented, and (d) has not adjusted for possible reductions in future baseline surpluses due to changes in economic projections.

SOURCE: Congressional Budget Office (2001), Joint Committee on Taxation (2001a, 2001b), and authors' calculations.

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THE TAX CUT

Removing the Social Security, Medicare and government retirement fund surpluses leaves an on-budget surplus of $2.3 trillion. Adjusting for the alternative minimum tax and expiring tax provisions reduces the available surplus to $2.1 trillion. If discretionary spending were held constant as a share of GDP, the remaining available surplus would be about $1 trillion. Thus, depending on what is considered the most reasonable assumption regarding current policy toward discretionary spending, the true baseline 10-year surplus before the tax cut was between $1.0 trillion and $1.7 trillion.

How the tax cut and other policies affect the surplus

A major criticism of the president's tax cut was that the administration was trying to force passage of it independent of the budget. These fears were well founded.

First, the Congressional budget resolution contains some $600 billion in spending above the baseline, after the interest costs are factored in. Second, allowing for the continuation of expiring provisions under current law and eliminating the gimmicky sunset provisions of the new tax law would cost an additional $523 billion over the next decade. Third, the president has already proposed an $18.4 billion increase in defense spending for next year. Since this money is mainly for salaries and health care, it should be considered permanent. Allowing this increase to rise with inflation and adding in the associated interest cost adds $271 billion in spending over the decade. Fourth, estimates of additional expenditures for bipartisan education programs total about $183 billion.

All told, these items would put the non-Medicare, non-Social Security part of the budget into deficit by more than $400 billion over the next decade. That is, the tax cut, combined with the programs proposed to date, would require that current program expenses be financed by borrowing or by dipping extensively into Medicare and Social Security surpluses.

Beyond the 10-Year Horizon

Under the CBO's baseline assumptions about discretionary spending, the fiscal gap through 2070 is 0.67 percent of GDP. That is, despite the current surpluses, a permanent tax increase or spending cut of 0.67 percent of GDP would be needed to achieve the same national debt-GDP ratio in 2070 as currently exists. The tax cut just enacted adds to these woes. Extended indefinitely, it would roughly triple the long-term fiscal deficit. Thus, cutting taxes was not a matter of giving unneeded funds back to taxpayers, but a decision to let future generations cover the costs of programs that current and previous generations approved.

Uncertainty

The CBO's underlying economic assumptions do not appear unreasonable, but there is still huge uncertainty regarding the economy and the budget surplus. The budget office reports optimistic and pessimistic scenarios, where the pre-tax-cut 10-year surpluses range from $8.8 trillion to $1.6 trillion. An important source of uncertainty stems from the backloaded nature of the projected surpluses. Only 12 percent of the baseline surplus is accumulated in the first two years, and only 36 percent in the first five years. This means that tax cuts based on projected surpluses are largely financed by funds that won't arrive for five years and may never appear.

ECONOMIC EFFECTS OF TAX CUTS

Output and Efficiency

Even before President Bush took office, his

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aides began arguing for tax cuts as a way to avoid recession. That raises several issues. First, is (or was) there a recession? Although the economy undoubtedly slowed, it is still unclear whether it has shifted into reverse.

Second, as Bush's economic advisers, Larry Lindsey and John Taylor, have acknowledged in the past, tax policy is a clumsy tool for fine-tuning the economy. Recessions can come and go in the amount of time it takes to implement changes in taxes.

Third, the Bush tax bill would have provided no immediate stimulus and channeled little of the benefit to low- and middle-income families, who could be expected to spend the windfall. Thanks to maneuvering in Congress, the bill was altered so that taxpayers will receive about $40 billion in rebates (technically, advance credits on their 2001 taxes) in the late summer and fall of 2001. But evidence from 1975, the last time such rebates were issued, suggests that only about half of that will be spent, resulting in a stimulus on the order of just 0.2 percent of GDP.

The Bush administration has also asserted that the tax cut will help people pay off credit card debt, and debt reduction is a form of saving. Yet, the president is also counting on the cut as an anti-recessionary device to increase consumption. He can't have it both ways.

The administration also defends the tax cut with arguments about its long-term effects. Perhaps the most compelling argument is that lower marginal rates will improve efficiency and increase incentives to work and save.

This argument is correct as far as it goes, but leaves out crucial elements. The efficiency gains will be offset to some extent by the sunset provisions, which create significant uncertainty. The myriad provisions for phasing tax cuts in and out will create incentives to shuffle money over time and across activities, which will waste resources. And cutting taxes now only to raise them later (when the government has to face its long-term fiscal problems) is, on balance, inefficient.

The effect on work effort is likely to be small, both because the decline in tax rates is modest and because most estimates suggest that work is not very responsive to tax rates. By the same token, a crude calculation suggests that personal saving would rise by just 0.3 percent of GDP. The impact is that large only because a substantial portion of the cuts go to high-income households, who save a larger share of their income than low-income households. The new incentives for retirement saving may or may not increase total private saving. The law may actually reduce the number of people with pension coverage because it expands the amount that business owners can contribute to IRAs, and thus may make them more reluctant to start pension plans. In any event, there is solid reason to believe that the major beneficiaries will be high-income households, who tend to use tax-based retirement incentives to shift sav-

HIGH INCOME HOUSEHOLDS RECEIVE A DISPROPORTIONATE SHARE OF H.R. 1836

INCOME GROUP	SHARE OF FEDERAL TAX BURDENS, 1999*	SHARE OF TOTAL TAX CUT**	SHARE OF INCOME TAX BURDEN, 1999*	SHARE OF INCOME TAX CUT**
Lowest 20%	1%	1%	-2%	1%
Next 20%	5	5	1	7
Middle 20%	11	9	7	11
Next 20%	19	15	16	18
Top 20%	65	71	79	64
Top 10%	49%	57%	63%	46%
Top 5%	37	47	50	35
Top 1%	21	38	29	25

* Congressional Budget Office (1999).
** Citizens for Tax Justice (2001).

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ings from one pot to another, rather than to increase the total.

The key point here, though, is that national (public plus private) savings is very likely to fall. Tax cuts reduce public saving by reducing the amount of money available to pay down government debt. This reduction in public saving will not be fully offset by increases in private saving, because taxpayers spend a portion of their gain.

Who Really Benefits

There are many ways to report the size of tax cuts. Consider a waitress who earns $22,000 and pays $72 in income taxes (after the child credit and before the earned-income credit), plus $3,366 in payroll taxes (Social Security and Medicaid). Compare her to a lawyer who earns $200,000 and pays $48,612 in income taxes and $15,250 in payroll taxes.

Bush's original tax cut would have reduced the waitress's income tax by $72 and the lawyer's by $8,413. Who gets the bigger tax cut? The administration would say the waitress did. Her tax cut is a larger share of her income tax, and she pays a smaller share of total income taxes after the tax than before.

However, reasonable observers would likely conclude that the lawyer got the larger cut. He enjoyed a bigger percentage decline in the sum of payroll and income taxes, a bigger percentage increase in after-payroll-and-income-tax wages, and, most important, a larger percentage increase in after-tax income. Needless to say, the lawyer also received a tax cut that in absolute terms is gigantic compared to the waitress's tax cut. Yet the administration would claim the lawyer gets the worst of the deal!

Of course, high-income taxpayers do pay more in taxes. However, under the new tax bill, they will receive cuts that are far in excess of the proportion of taxes they actually pay. The top 1 percent paid about 21 percent of total federal taxes in 1999, but will receive about 38 percent of the tax cut when it is fully phased in. The disparity is mainly due to the abolition of the estate tax. No justification has been presented by any tax advocate for why the share of the tax cut going to the very highest income group should exceed the share of taxes that households in that group pay. This is especially relevant in light of the fact that, over the last 20 years, most of the gains in after-tax income have gone to the highest income groups.

There is more to distribution than who pays the taxes. If the tax cut reduces government spending, and if such spending mainly benefits lower- and middle-income families, then the reduction in government spending induced by the cut should be taken into account. From that perspective, the new tax law is even more regressive than it looks.

Other justifications

As explained above, the most common justifications for tax cuts – their affordability, their impact on economic activity, and their counter-cyclical nature – just don't wash. But advocates of the cuts have offered a slew of other reasons worth considering.

Americans are overtaxed. At 20.6 percent of GDP – up from 17.2 percent in 1992 – tax revenues are at peacetime highs and only slightly lower than they were in World War II. The rising share of taxes in the economy is the natural result of tax increases in 1990 and 1993, the long economic expansion of the 1990s, the rise in capital gains realizations, and rapid income growth among high-income households. But that doesn't in itself mean Americans are overtaxed. Aggregate tax revenues have only risen in recent decades because incomes rose dramatically among

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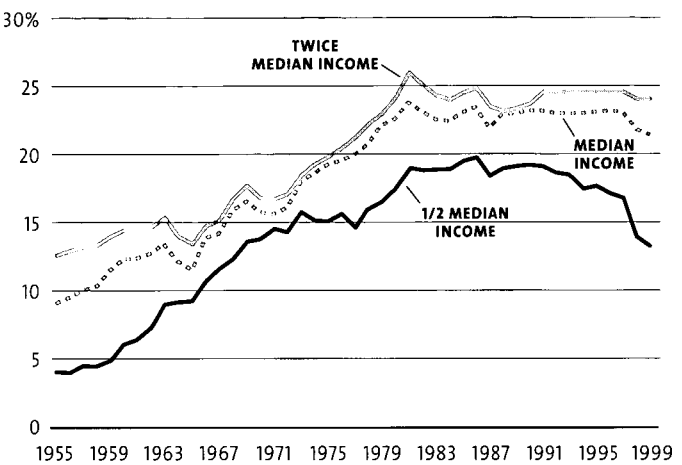
households with the highest tax rates. Whether we are overtaxed is ultimately a value judgment, but the facts suggest that compared to other countries and other times, taxes on the vast majority of American households are low.

Tax cuts are needed to restrain the size of government. The claim here is that the surplus provides too much temptation for Congress, and that government spending is too high. But that is a claim that is not easy to defend. First, government spending as a share of GDP is at its lowest level since 1966. Not counting interest payments – which are the results of previous years' policy – government spending was at its lowest share of the economy since 1957. Defense spending is at its lowest share of GDP since before World War II. Other discretionary spending – the source of most pork-barrel stories – is at its lowest share since at least 1962. Even mandatory spending is a smaller share of GDP now than 10 years ago. So it hardly seems that government spending is out of control.

AVERAGE FEDERAL INCOME PLUS PAYROLL TAX RATE



SOURCE: U.S. Department of Treasury, 1998. Average and Marginal Federal Income, Social Security, and Medicare, and Combined Tax Rates for Four-Person Families at the Same Relative Positions in the Income Distribution, 1995-1999. Office of Tax Analysis, Jan. 15.

Second, the argument that government spending is too high is distinct from the claim that some spending is wasteful. Reforming the incentives that lead to government waste is a laudable objective, but absent such reform one must accept the reality that some government spending will always be wasteed. This reality will likely reduce the optimal level of government spending, but it does not imply that the optimal level is lower than the current level.

Third, smaller surpluses or larger deficits probably do constrain spending. Indeed, anecdotal evidence suggests that the pressure of large deficits helped restrain spending in the 1980s and that the budget rules helped restrain spending in the 1990s. But the view can be overstated. There was no sustained decline in spending following tax cuts in 1964 and 1981. And even though revenues rose throughout the 1990s, government spending did not.

Fourth, as a way to cut spending, tax cuts are a fiscal gamble. About 64 percent of government spending in 2000 was in four categories: Social Security, Medicare, defense and net interest. Thus, a serious reduction in government spending either requires that those expenses be cut – which seems unlikely – or that remaining programs be trimmed. If taxes are cut and spending isn't, well – think back to the debt buildup in the 1980s.

Tax cuts are needed to avoid paying off the public debt. Alan Greenspan's argument, re-

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peated by tax-cut advocates, is that without a tax cut, marketable government debt would all be paid off around 2006. This, those advocates say, would interfere with the private economy by forcing the Treasury to amass assets in private securities, while the lack of marketable government debt would make securities markets less efficient.

A tax cut, however, is not the only – or even the best – way to increase the government's marketable debt. Tax cuts increase the government's long-term liabilities (that is, the long-term fiscal gap). A better approach would be to increase the government's marketable debt without increasing its long-term liabilities. For example, government trust funds currently holding marketable government debt could invest in other assets instead. Or the government's existing implicit liabilities (like future Social Security benefits) could be converted into explicit liabilities. This is the essence of another of President Bush's campaign proposals: to siphon payroll taxes into private accounts. By transferring tax revenues to private accounts meant to offset reductions in future Social Security benefits, the government would be increasing its marketable debt but reducing its unfunded Social Security liability at the same time. In any case, the prospect of shrinking debt markets does not justify a tax cut any more than it would justify a spending increase.

CONCLUSION

Although Bush called his plan a "a tax cut with a purpose," the purpose kept changing, while the tax cut stayed the same. Remarkably, almost every event or cause seemed to justify not only a tax cut in general, but a particular tax cut designed in November 1999 to fend off Steve Forbes's challenge for the presidential nomination. In the end, there was little coherent rationale, either for a large tax cut in general or for the particular relief that Bush advocated.

The biggest cost of the tax cut could prove to be the missed opportunities. Readers trying to assess the situation might consider which social or economic problems they would have addressed if they had $1.7 trillion to allocate over the next decade. The administration chose to give more than one-third to the richest 1 percent of taxpayers and more than 70 percent to the richest 10 percent. Alternatively, the funds could have been directed toward smoothing the way for Social Security and Medicare reform, simplifying the tax system, helping low-income households, improving education, health care, environmental protection, public infrastructure, inner cities and so on. But that is water over the dam. Probably the best hope now is to repair some of the damage through tax changes that don't sacrifice more revenue and to alter the budget process to minimize the sorts of confusion that made it possible for the Bush administration to pretend that Washington was rolling in dough.

Cleaning Up the Mess

A first task is to clarify the sunset provisions and the phaseout rules. No one really believes the entire tax cut will sunset in 2010. But leaving the resolution hanging creates gratuitous uncertainty that hampers tax planning and efficient economic responses.

A second task is to spare the middle class any contact with the alternative minimum tax. The AMT should be indexed for inflation, deductions should be allowed for dependents and state and local taxes, and all personal credits should be available to offset it.

A third is to change the credits that phase out across different income ranges. The phaseouts create hidden taxes over the phaseout

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range, and diminish the effectiveness of the credits in encouraging the activities they are designed to spur.

A fourth is to consolidate tax provisions with similar purposes. For example, it makes sense to combine features of the tax code that subsidize children – the earned-income tax credit, the dependent exemption, the child credit and the like. Several recent proposals would coordinate the three tax subsidies, adopting a common definition of a qualifying child that would make taxes simpler for low-income households. Much the same could be said for the myriad programs subsidizing college education and retirement savings, as well as for the numerous tax rates on capital gains.

Learning from Mistakes

But the single most important policy choice Washington could make would be to develop a budget that better describes the government's true fiscal status. Many of the problems with the current system are described above. Retirement trust funds are recorded on a cash-flow basis. Projections of current spending and tax policy are unrealistic and there is no allowance for levels of uncertainty. There is no adjustment to the baseline to account for uncertainty.

A few changes could make a big difference. First, Congress should remove accumulations in trust funds for Social Security, Medicare and government pensions from the baseline budget, and reaffirm its commitment not to spend these resources on anything other than previously legislated benefits. The baseline could also provide more realistic projections of policy by adjusting discretionary spending for population growth, by assuming that temporary provisions will be extended, and by stipulating that the percentage of tax filers facing the alternative minimum tax will not be allowed to grow.

The second change would set some of the baseline surplus off limits in case tax and spending projections are not realized. Robert Reischauer, currently the president of the Urban Institute and formerly the director of the Congressional Budget Office, has proposed that Congress commit only a portion of future surpluses to tax cuts or new spending – in effect, creating a rainy-day fund.

The third change would improve estimates of the costs or benefits of new tax and spending initiatives to prevent manipulation of the 10-year budget estimates. Stipulating that all tax or spending programs must be treated as fully phased in within, say, five years would allow time for adjustment but would ensure that 10-year costs remain valid indicators of the long-term effects. Temporary tax or spending policies should be treated as permanent, and the costs of tax changes should include the cost of changes in the alternative minimum tax to ensure that the tax cut does not raise the number of taxpayers subject to the AMT. Finally, including the interest costs linked to higher federal debts associated with higher spending or lower taxes would provide a truer measure of the cost of the plan.

The current debate started from the premise that with a $5.6 trillion surplus, the president's $1.6 trillion tax cut was easily affordable. But using the rules above, the baseline budget surplus would be $1.7 trillion over the next 10 years, and the Reischauer rule would reserve $800 billion of it against forecasting errors or rainy days. That would leave about $900 billion to play with, but the tax bill would be seen as costing more than $2 trillion.

Establishing new rules may seem a dreary exercise. But we've just seen what an exciting alternative can mean for the country: a debate riddled with misinformation and a tax bill that sets new lows in budget gimmicks. Let's break out the NoDoz and get to work.

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Why the reins should be loosened

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DAVID ROBERTSON/HARMONY HOUSE

Regulation on thoroughbred horse racing

by Louis A. Guth and Michael D. Shagan

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RACE DEREGULATION

In his standard reference work *The Economics of Regulation*, Alfred E. Kahn identified the factors that distinguish competitive markets from those driven by regulation. With competition, he noted, the government does not decide who should produce what in what quantity. Nor does it control investment or entry or the way the product is marketed. Yet, while Kahn dissects the consequences of government intervention in industries ranging from agriculture to liquor, nowhere does he mention horse racing or the other parimutuel betting sports, including greyhound racing and jai alai.

To be sure, regulation of racing is motivated in part by society's ambivalence about gambling. Leaving that aside, however, there is much to be said about the purely economic aspects of the regulation, particularly in view of the sweeping changes in the broader market for legal gambling in the last few decades. In particular, we would argue there is a powerful case for eliminating many of the rules for how horse racing is organized – strictures that simply don't make sense in light of any modern rationale for economic regulation.

THOROUGHBRED RACING REGULATION – A BRIEF INTRODUCTION

Most economic regulation of thoroughbred racing was formulated when parimutuel gambling on horse races (in which gamblers bet against each other rather than against the "house") accounted for virtually all legal gambling in the country outside Nevada. Actually, the current regime hasn't been around very long; regulated parimutuel thoroughbred racing was introduced in Florida in 1931. California followed, through amendment of its state constitution, in 1933. Thoroughbred racing dominated legal gambling until well after World War II. Even as recently as 1982 – 18 years after New Hampshire reintroduced the state lottery – thoroughbred racing accounted for half of all gambling revenues outside Nevada.

The rationale for economic regulation had three parts: (a) to control the private profitability of a legal monopoly; (b) to limit the volume of gambling; (c) to generate government revenues. While the second rationale takes us outside of the realm of economics, the first amounts to meat and potatoes for regulatory economists.

Competition relies on the ability of companies to enter and exit markets freely and thus drive down prices and profits to competitive levels. With free entry, companies become "price takers," with very limited ability to set prices independent of competitive factors. However, if there are practical or legal limitations on entry and exit – think of electricity distribution – some companies have substantial ability to be "price makers." That is, these companies can set prices to maximize profits without concern for the behavior of potential rivals. Economic regulation is thus imposed to drive prices and output toward competitive levels.

Thoroughbred racing fits well here. It's worth noting, though, that the third rationale for regulation – raising revenues – is an awkward fit because government need not regulate to raise revenue from product sales. Think gasoline.

In the traditional model, state racing commissions license racetracks and trade associations to conduct live racing for specified seasons. This pretty much establishes what is

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produced, in what quantity and by whom. The racetracks conduct the races, market the product, and oversee parimutuel wagering. Types of wagers – win-place-show, daily doubles, etc. – are subject to state approval. Live wagering at the track determines the racetrack's "handle," the total amount bet. Regulators, in turn, set prices by fixing the "takeout," the amount of the handle retained by the track. Typically, for every dollar bet, about 20 cents is kept from the parimutuel pool.

From a gambler's standpoint, the takeout is the price for betting on thoroughbreds, just as the average retention rates on slot machines and roulette are also prices for gambling. The gross revenue of the track is therefore the aggregate takeout for the racing season. It is used to cover all costs, including purses and excise taxes.

GALES OF CHANGE

In the last two decades, there has been explosive growth in gambling, such that thoroughbred racing no longer is the dominant "non-Nevada" factor in gambling. From 1982 to 1999, the gross revenue from all legal gambling in the United States increased from $10.4 billion to $59.5 billion – an annual growth rate of 11 percent. Gross revenue for horse racing, however, grew only to $3.5 billion from $2.25 billion, a rate of less than 3 percent. Factors influencing this relative weakness included the rise of casinos along with rapid growth in state lotteries.

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RACE DEREGULATION

The number of thoroughbred races in the United States has steadily declined, while the handle has grown modestly and purses somewhat more robustly. In addition, attendance and television coverage have fallen. Horse racing's share of the United States gambling dollar declined from about 22 percent in 1982 to less than 6 percent in 1999.

The second factor driving change has been the increasing role of betting away from the scene of the action through simulcasting to or from other thoroughbred tracks, to other-breed racetracks and to off-track betting facilities. It also comes from telephone and Internet "account" wagering. The parimutuel handle from account wagering was about $500 million in 1998, but account wagering is expected to grow rapidly.

As recently as the early 1980s, thoroughbred handle generated somewhere other than at the track where the race was run amounted to a small portion of the total. But by 1988, the nonlive share had jumped to about 30 percent, and today it is roughly 80 percent. Thus, there has been an increasing reliance on simulcasting and expanded networks of off-track betting outlets to generate parimutuel handle. This has drastically changed the business of thoroughbred racing.

As the horse racing industry is constituted today, there are three broadly defined profit centers: live racing at the host track; simulcasting "out" from the host track; simulcasting "in" from other tracks. There are also ancillary revenue sources. Some states, for example, permit tracks to operate slots and other gambling machines.

Live Racing

A state licensee is assigned a number of racing dates. Usually, a minimum number of races will be required on each assigned race date. Revenue sources from the parimutuel handle consist of the takeout (around 20 percent), rounding in the track's favor (around 0.5 percent), and uncashed winning tickets (also around 0.5 percent). The takeout distribution varies not only by jurisdiction but also by type of wager.

Beneficiaries of the takeout revenue include the horsemen (through purse payments), the breeders (usually through purse supplements), the state and its racing commission (for operating revenues plus revenues to the state) and the track (for expenses and profit.) There may be other specified beneficiaries or designated projects – for example, an industrywide promotional fund.

Simulcasting

When a track receives permission to simulcast its live races at other locations, the licensee is generally referred to as the "host" track. "Guest" locations may be in the same state or elsewhere. Before1991, wagering on the host's races in another jurisdiction was conducted through separate parimutuel pools. Today, virtually all betting pools are "merged pools" commingling host and guest betting.

Commingled pools have the advantage of eliminating arbitrage opportunities in which offsetting bets in two different pools can result in a net win. More important, large bettors value market "depth." In racing industry parlance, when a bettor makes a large wager in a relatively small parimutuel pool, the bettor is effectively "betting against herself" since if the bet turns out to be a winner, the rate of payoff is greatly diminished.

When there are separate pools, the guest state's takeout rates typically apply. When there are commingled pools, the host state's takeout rates are used. The host track almost always sets a fixed price for the use of the signal of its races and the right of the guest's cus-

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tomers to wager on them. This price is generally around 3 percent of the handle, but can be as low as 2 percent and as high as 4.5 percent. Rights to simulcast high-profile races – the Triple Crown, the Breeders' Cup – command a substantial premium.

Host tracks also accept simulcast signals from other tracks, so their customers can wager at the live track and at OTB outlets they may control. In other words, a host may also serve as a guest and pay the host fee to the track putting on the live race. In such situations, the takeout available in the guest state is net of the host fee and is often subject to a different distribution formula.

Horse racing's share of the United States gambling dollar declined from about 22 percent in 1982 to less than 6 percent in 1999.

REVISITING REGULATION

These recent changes suggest why it is time to reconsider regulation of thoroughbred racing. First, the argument that the tracks have market power is considerably less credible, both because of increased competition from other forms of gambling and diminished market share for local parimutuel betting. There is far more competition across states – as opposed to within states – because of the increasingly important role of off-site wagering.

Arguably, competition between forms of gambling – say, between parimutuel betting and the state lottery – is limited. The first, after all, involves processing significant information about the horses, jockeys and track conditions. The "price" to play is 15 to 20 percent of the bet. The lottery, by contrast, is random, and the price is typically 50 percent of the bet. Moreover, the lottery offers an extremely low probability of winning an extremely large prize. But the lack of overlap between gambling submarkets is less an argument against deregulation than one for allowing midcourse corrections.

A second reason for reconsidering regulation of thoroughbred racing is that the whole business model has changed. Most states still set excise taxes based on track handle. When the entire handle was from live racing, slippage between handle and track revenues could be ignored because regulators also set the takeout rate. But that no longer holds, and setting excise taxes as a percentage of handle now makes about as much sense as taxing a bank in proportion to its gross deposits.

The opportunities for expansion in a deregulated environment could be substantial. Were a more competitive horse racing sector to account for, say, 8 percent of the total handle in legal gambling (compared with 6 percent today), we estimate that 35,000 additional jobs in agribusiness would be created.

THE NUTS AND BOLTS

We focus on 12 states – California, Delaware, Florida, Illinois, Kentucky, Maryland, New Jersey, New York, Ohio, Pennsylvania, Texas and West Virginia – that account for two-thirds of thoroughbred races, four-fifths of the handle and three-quarters of the purses.

Licensing Requirements. Licensing is perhaps the single most important component of safety and integrity regulations, which aim to make racing safe for horses and jockeys and to maintain integrity (necessary to encourage

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bettors to participate in parimutuel pools). In this regard, the various states' roles are analogous to that of the Securities and Exchange Commission. The SEC, after all, ensures that securities investors are fully informed and minority shareholders are protected. As such, safety and integrity regulation deserves ongoing support.

Market Structure. Most states give racing commissions the authority to set racing seasons, and most limit thoroughbred racing to the daytime. One result is that there is virtually no head-to-head competition among thoroughbred racetracks within metropolitan areas. Racing times are simply parceled out among potential rivals within states to ensure regional monopolies.

	LIVE THOROUGHBRED HANDLE AS PERCENT OF LIVE THOROUGHBRED PLUS STANDARDBRED HANDLE	TOTAL THOROUGHBRED HANDLE AS PERCENT OF TOTAL HANDLE
Ohio	39.6%	52.0%
New Jersey	40.2	76.5
Illinois	66.2	71.3

	LIVE THOROUGHBRED PERCENT OF TOTAL HANDLE	LIVE DOG PERCENT OF TOTAL HANDLE	TOTAL THOROUGHBRED PERCENT OF TOTAL HANDLE	LIVE DOG PERCENT OF TOTAL HANDLE
Florida	14.9%	25.0%	46.1%	46.8%
West Virginia	21.1	29.6	58.3	41.7
Texas	16.2	13.9	75.1	24.9

Pennsylvania is the exception. It permits tracks to set their own racing seasons and permits nighttime racing. But this more relaxed approach largely reflects fortunate geography; the two thoroughbred tracks are more than 100 miles apart. Competition among tracks thus typically takes place in the political rather than the economic marketplace. With three tracks (Calder, Gulfstream and Hialeah), tensions over the division in Florida often run high and will probably bubble into the open because state regulation over racing seasons is scheduled to expire in 2002.

Interbreed competition. Adding to the maze of economic regulation, states allocate dates, times and simulcast rights among thoroughbreds, standardbreds (harness racing) and, in some places, greyhounds. (Quarter horses, which are very fast runners but lack the endurance of thoroughbreds, are currently a smaller competitive factor because betting handles are small.)

Only three of our 12 key states have significant harness competition.

Note that thoroughbred racing's share of total handle – that is, including simulcast-related revenues – is significantly larger than its share of live racing. The explanation must be that, all else equal, bettors prefer thoroughbred racing, which implies that the regulated allocation is inefficient.

By the same token, only Florida, West Virginia and Texas have significant greyhound competition. Once again, the simulcast numbers imply that bettors' preferences are out of synch with regulation.

Ohio, Florida and Illinois provide compelling examples of the unfortunate consequences of market segmentation by regulatory fiat. With substantial greyhound interests to protect, Florida prohibits Calder and Gulfstream from receiving any simulcasts when the facility is not operating live. This means that all parimutuel operations at the two tracks are shut down when they do not have live racing, greatly reducing the annual betting handle. Yet these thoroughbred tracks must provide their own signal to non-thoroughbred sites nearby.

Ohio allocates rights differently, designating "in-state hosts" for simulcasting and excluding night harness tracks in competitive metropolitan areas from carrying daytime thoroughbred signals. However, Ohio also

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prohibits daytime thoroughbred tracks in the same circumstances from carrying thoroughbred racing cards that commence after 4 p.m., making these available only to the harness track.

Illinois also uses the in-state host concept and permits its harness tracks to simulcast thoroughbred racing. Unlike Ohio, however, Illinois dictates how takeout at harness tracks from thoroughbred simulcasts is rerouted back to the host track and to pools for purses at that track.

Distribution. Of the states we studied in detail, three regulate the number of simulcast signals that can be imported and carried, and about half the states impose preferences for within-state signals over out-of-state signals. At least five states designate an in-state host track for coordination or control of imported simulcasting. That is, one track – usually the one carrying live races – negotiates for imported simulcasting and then provides the signal to other tracks or off-track facilities within the state. Some states, notably Pennsylvania, permit each track to arrange for its own simulcasting. In both circumstances, however, regulation creates geographic market segmentation that parallels live racing. For example, almost every state restricts the time of day during which a thoroughbred track may simulcast.

Types of wagers. All states allow various forms of multiple bets and exotic bets. Regulated takeout rates tend to be higher on the multiple and exotic bets, presumably because the bettors are less sensitive to prices. Florida permits its tracks to file for "experimental wagers." If an experiment proves popular, the track may then ask for permanent status.

Takeout. Takeout rates are regulated in most states. Only Florida does not regulate takeout, while Pennsylvania allows a degree of flexibility for takeout on exotic wagers. As a practical matter, however, racetracks do not deviate from the target rate even when permitted, because excise tax rates and other considerations make it uneconomic to go below a ceiling rate.

Fixing takeout rates is comparable to setting tariffs in traditional utility regulation. The average takeout – also referred to as the "blended" rate – across the 12 key states varies from 19.4 percent to 22.4 percent. No states currently allow broad variation in takeout rates in response to perceived differences in demand – say, by taking a bigger cut on popular stakes races and a lower one on run-of-the-mill claiming races.

Most price regulation is expressed as a percentage of the handle. However, as noted above, with the substantial growth of OTB, Internet and telephone wagering, and and the dominance of commingled pools, a significant portion of takeout revenues may be dictated by rules established in other states or by other tracks. Regulation also prevents most racetracks from experimenting with the structure of takeout – preventing the setting of different rates for different types of races and wagers in response to demand. This is very important because the experience with price deregulation in airline fares, brokerage firms' commissions, phone prices and the like suggests that significant gains in efficiency are achieved through restructuring rates rather than changing their absolute level.

	TAX AS PERCENT OF TOTAL HANDLE	TAX AS PERCENT OF TAKEOUT
New York (1998)	3.30%	14.90%
Illinois (1998)	4.31	19.31
California (1998, before reform)	4.06	20.94
California (1999, after reform)	2.39	11.04

Excise Taxes. Only three of our 12 key

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states have tax rates well in excess of typical sales tax rates.

RELAXING REGULATION

Four key conclusions buttress the case for less regulation. First, the basic economics of thoroughbred racing imply that the greater the handle, the greater the economic pie to be divided among the racetracks, the horsemen who breed, train and race, and the tax collector. Thus, relaxing restrictions on distribution of thoroughbred racetrack services and parimutuel betting via OTB and account wagering would probably have the greatest direct impact on the industry.

Second, total betting handle is almost certainly determined in part by a combination of wager types and takeout rates. With all else equal, the volume of betting increases with the availability of exotic wagers. And, while the size of the handle may not be very responsive to the average takeout rate, the dollar volume of betting would certainly increase if the regulation of takeout were relaxed to permit variation for different types of races and if racetracks could more easily introduce new wagers. Just as airlines price seats on the same flight differently to different fliers with different elasticities of demand, casinos vary takeout rates on gambling tables and slot machines depending on location and types of bettors likely to frequent them.

Third, handle tends to increase with the quality of racing. A race with better horses of like ability – and more of them – increases handle. This effect creates a virtuous circle: increasing handle increases purses, which improves race quality, which increases handle. Thus, relaxing regulation would not only positively affect handle directly, but indirectly as well. While we can understand why states impose floors on the number of live racing days in order to promote live racing, the longer-term solution lies in more betting volume and larger purses.

The final element here is the need for a new business model for racetracks. When racing was all about live races and on-site betting, it coexisted with a tight regulatory framework. Today, racetrack revenues come principally from simulcast betting and off-track betting. Revenues also include fees on races exported via simulcast, other entertainment and dining revenues, and other gambling revenues – as for example, from slot machines in Delaware and West Virginia. And less regulation makes sense in an environment in which the profits go to the nimble.

Increasing the scope for experimentation. A key lesson from deregulation of virtually all industries – everything from airlines to natural gas pipelines – is that it is impossible for anyone to predict accurately how innovation will proceed. Therefore, in any transition, states should be open to new types of distribution and new types of marketing, subject only to safety and integrity standards.

Transforming legal claims on the handle into tradable rights. When a state mandates a racetrack to undertake an activity, it creates an economic "right." For example, Ohio law permits harness tracks to simulcast thoroughbred racing. A right becomes "tradable" when the state permits the holder to sell it to the party best positioned to maximize its value.

In principle, Ohio law is currently structured to permit tradable rights in simulcasting. In practice, though, trading would be a messy business because third parties would also be affected. A better example in practice would be in Kentucky. Keeneland Racetrack, a thoroughbred track, acquired rights to be in-state host for all thoroughbred simulcasting into Kentucky from the Red Mile harness

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track during a portion of the year when Red Mile controlled those rights.

WHAT MUST BE DONE

Enable the industry to market its product. To beat the proverbial live horse, growth in handle is the key to enabling thoroughbred racing to thrive in a less regulated environment. Hence, among other reforms, states should get out of the business of limiting signal exports. Similarly, states should not restrict other forms of distribution of thoroughbred racing, including OTB and account wagering. Today, OTB outlets number fewer than 40 in heavily populated states, including California, Illinois and Pennsylvania. Texas, New Jersey and Florida do not permit OTB and account wagering at all. But in each of these states, there is widespread distribution of state-sponsored lottery gambling. To enhance free markets, states should, at most, set reasonable licensing conditions for OTB and account wagering and let the market determine the distribution.

DAN DRY

Enable the industry to price and design its products. States should stop regulating takeout rates. Designing pricing strategies to appeal to different sorts of bettors is the essence of competition in free markets. It is the most certain natural outgrowth of deregulation, while being the least predictable in specifics. For similar reasons, states should routinely permit new wager types – with full disclosure to bettors.

The corollary to free pricing and product innovation is free entry and exit. In a free market, racetracks would negotiate with their horsemen and then unilaterally declare their seasons for the coming year. The resulting competition would have to factor in not only local market expectations, but also national simulcast market considerations. The less radical alternative would be to give tracks the right to negotiate for extensions and overlaps of thoroughbred seasons.

A second-best option would be to auction off racing dates to the highest bidder prior to the start of each racing season – the process now used by the FCC to allocate spectrum to cell phone systems and the like. Again, the advantage would be improving allocation to those bidders most likely to meet customer demands effectively.

Let consumer preference drive interbreed competition. Thoroughbred racetracks should be free to buy and to sell simulcast signals

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based on market considerations. The data suggest that demand is generally greater for thoroughbred simulcasting than for harness or greyhound races. Hence deregulation in this area would undoubtedly face opposition from harness and greyhound interests. In transition, therefore, the use of tradable rights would reduce conflict. This is akin to a policy of controlling the number of licenses, but then making the licenses fully tradable.

There are, of course, other ways of resolving interbreed conflicts. In Maryland, for example, thoroughbred and harness interests have been aligned by a system of sharing all simulcasting revenues, regardless of origin, on a 80-20 basis – a process dubbed "parity." Parity makes all interests indifferent to – or at least less interested in – whether handle comes from live racing, in-state imports or out-of-state imports.

The approach adopted by Illinois is somewhat different, but also works towards parity. Illinois directly mandates a dollar distribution of out-of-state simulcast race handle between in-state hosts and nonparticipating tracks. For example, a harness track carrying a simulcast thoroughbred card pays 3.25 to 4.625 percentage points of the overall takeout to the in-state thoroughbred host track and 6.5 to 9.25 percentage points to the host track's purse pool. The rules thus guarantee that significant sums flow back to thoroughbred racing from simulcast rights granted to harness tracks.

Contrast this with Florida. The Gulfstream and Calder racetracks would be able to compete better if they could market thoroughbred racing year-round. But Florida apparently assumes that greyhound racing could not thrive in a more competitive environment. Two possible routes to greater efficiency: allow thoroughbred and greyhound track owners to align interests by revenue sharing, or allow thoroughbred interests to buy greyhound simulcast rights.

Tax racing like an ordinary business. In most states, large portions of state excise taxes are plowed back into racing infrastructure and regulatory support. Only two or three states have a tax rate that seems excessive compared with local sales taxes. As a general matter, it is difficult to support a tax level in excess of the direct and indirect costs of supporting racing. Thus, as mentioned earlier, we believe each state should determine the level of these costs and of corresponding benefits in evaluating the appropriateness of aggregate tax burdens of racing.

There's a second issue here. Most states' excise taxes are a percentage of the handle, which makes little sense if price flexibility is to be encouraged. Taxes pegged to the net (track takeout) rather than the gross are more consistent with efficiency. Among our 12 key states, only Delaware currently uses this approach.

Note, however, that collecting tax dollars via an excise tax distorts relative prices and, therefore, consumer decisions. A state that really wants to go for efficient markets should consider the alternatives of profits taxes or lump-sum taxes on racing licenses.

Eliminate regulation of ancillary services. Several states regulate the prices and availability of everything from racetrack hot dogs to parking. Dumping such regulation would be a no-brainer.

Transparency. The thoroughbred industry and its regulators should recognize that relaxing direct economic regulation of the industry would increase the need to provide information to bettors about takeout rates for parimutuel betting. Consumer interest in betting is closely linked to the beliefs that bettors are treated fairly and that racing is honest.

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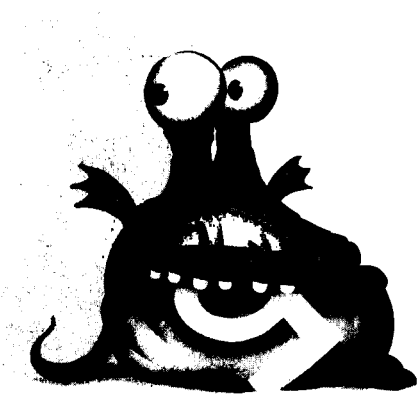
Damned Lies and Statistics

ILLUSTRATIONS BY
BILL MAYER

Remember the old saw that figures don't lie, but liars do figure? Joel Best, the author of *Damned Lies and Statistics: Untangling Numbers from the Media, Politicians and Activists* (University of California Press), would probably not be so kind to the figures. Indeed, Best, who teaches sociology and criminal justice at the University of Delaware, plainly spends a good portion of his time at the office teasing elusive truths from the witches' brew of numbers that pervade debates over public policy. ¶ This witty, well-written excerpt – from a chapter of the book titled "mutant statistics" – is apt to leave the reader more depressed than angry. For much of the difficulty with numbers discussed therein is a product of ignorance rather than of intent. Read it and weep. Or, at the very least, learn to view statistics and the nice folks who peddle them as proof of this or that with deepest skepticism.



BY JOEL BEST

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Not all statistics start out bad,

but any statistic can be made worse. Numbers – even good numbers – can be misunderstood or misinterpreted. Their meanings can be stretched, twisted, distorted or mangled. These alterations create what we can call "mutant statistics" – distorted versions of the original figures.

Many mutant statistics have their roots in innumeracy – difficulty grasping the meaning of numbers and calculations – which is widespread. Not only is much of the general public innumerate, but also the advocates promoting social and economic problems are often not any better. They may become confused about a number's precise meaning. They may misunderstand how a problem has been defined, how it has been measured, or what sort of sampling method has been used. At the same time, their commitment to their cause ("After all, it's a big problem!") may lead them to improve a statistic, to make the numbers seem more dramatic, more compelling. Some mutant statistics may be products of advocates' cynicism, of their deliberate attempts to distort information in order to make their claims more convincing. This seems particularly likely when mutation occurs at the hands of large institutions that twist information into the form most favorable to their interests. But mutation can also be a product of sincere, albeit muddled, interpretations by innumerate advocates.

Once someone utters a mutant statistic, there's a good chance that those who hear it will accept it and repeat it. Innumerate advocates influence their audiences: the media repeat mutant statistics and the public accepts – or does not challenge – whatever numbers the media present. A respected commentator may hear a statistic and repeat it, making the number seem even more credible.

As statistics gain wide circulation, number laundering occurs. The figures become harder to challenge because everyone has heard them and everyone assumes they must be correct. This is especially true when numbers reinforce our beliefs or interests. ("Of course that's true!")

Consider one widely circulated statistic about the dangers of anorexia nervosa. Anorexia usually occurs in young women, and some feminists argue that it is a response to societal pressures for women to be beautiful and to cultural standards that equate slenderness with beauty. Advocates who were seeking to draw attention to the problem estimated that 150,000 American women were anorexic, and noted that anorexia could be fatal.

At some point, some feminists began reporting that each year 150,000 women died from anorexia. (In fact, only about 70 deaths a year are attributed to anorexia.) This simple transformation – turning an estimate for the total number of anorexic women into the annual number of fatalities – produced a dramatic, memorable statistic. Advocates repeated the erroneous figure in books, in newspaper columns, on talk shows and so on. There were soon numerous sources for the mistaken number. A student searching for material for a term paper on anorexia, for instance, had a good chance of encountering – and repeating

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– this wildly inaccurate statistic, and each repetition helped ensure that the mutant statistic would live on.

Yet it should have been obvious that something was wrong with this figure. Anorexia typically affects young women. In the United States, roughly 8,500 females 15 to 24 years old die from all causes each year; another 47,000 women aged 25 to 44 also die annually. What were the chances, then, that there could be 150,000 deaths from anorexia each year?

But, of course, most of us have no idea how many young women die each year. ("It must be a lot.") When we hear that anorexia kills 150,000 young women a year, we assume that whoever cites the number must know that it is true.

LET ME COUNT THE WAYS

How and why does mutation occur? Here, I explore four common ways of creating mutant numbers, beginning with the most basic error – making inappropriate generalizations from a statistic. I then turn to transformations – taking a number that means one thing and interpreting it to mean something completely different. Next, I explore confusion – transformations that involve misunderstanding the meaning of more complicated statistics. Finally, I consider compound errors – the ways in which bad statistics can be linked to form chains of error. In these four ways, bad statistics not only take on lives of their own, but they do increasing damage as they persist.

Generalization: Elementary Forms of Error

Generalization is an essential step in statistical reasoning. We rarely are able to count all the cases of some social problem. Instead, we collect some evidence from a sample and generalize from it. Generalization involves some basic processes: the problem must be defined, and a means of measurement and a sample must be chosen. These are elementary steps in social research. But even the most basic principles can be violated and, surprisingly often, no one notices when this happens. Mutant statistics – based on flawed definitions, poor measurements or bad samples – emerge, and often receive a surprising amount of attention.

Questionable Definitions. Consider the flurry of media coverage about the so-called epidemic of fires in African-American churches in the South in 1996. Various groups charged that the fires were the work of a racist conspiracy. Their claims recalled the history of racial terrorism in the South: black church-

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es had often been targets of arson or bombing. Perhaps because 1996 was an election year, politicians – both Democrats (including President Clinton and Vice President Al Gore) and Republicans – denounced the fires, as did both the liberal National Council of Churches and the conservative Christian Coalition.

Activists (such as the anti-racist Center for Democratic Renewal) tried to document the increased number of fires, producing lists of church arsons and statistics about the number of suspicious fires as evidence that the problem was serious. However, investigations, first by journalists and later by a federal task force, called those claims into question.

While there were certainly some instances in which whites burned black churches out of racist motives, there was no evidence that a conspiracy linked the fires. Moreover, the definition of what was a racially motivated church fire proved to be unclear; the activists' lists included fires at churches with mostly white congregations, fires known to have been set by blacks, teenage vandals or mentally disturbed people, and fires set to collect insurance.

When journalists checked the records of the insurance industry, they discovered not only that the number of fires in 1996 was not unusually high, but also that church arsons had been generally declining since at least 1980. The federal task force ultimately failed to find any evidence of either an epidemic of fires or a conspiracy.

In short, statistics attempting to demonstrate the existence of an epidemic of church arsons lacked a clear definition of what ought to count as a racially motivated church fire. By the same token, those who claimed there was an epidemic did not define the number of fires it would take to constitute one. Indeed, the absence of any clear definitions made it difficult to assess the evidence. The advocates who offered lists of fires (and asserted that each was evidence of a racist conspiracy) may have been convinced, but those who tried to identify cases using some sort of clear definition failed to find any evidence of an epidemic.

Inadequate Measurement. Clear, precise definitions are not enough. Whatever is defined must also be measured, and meaningless measurements will produce meaningless statistics. For instance, consider recent federal efforts to count hate crimes – crimes motivated by racial, religious or other prejudice.

In response to growing concern, the Federal Bureau of Investigation invited local law enforcement agencies to submit annual reports on hate crimes within their jurisdictions and, beginning in 1991, the bureau began issuing national hate-crime statistics.

Although the FBI had collected data on the incidence of crime from local agencies for decades, counting hate crimes posed special problems. When police record a reported crime – say, a robbery – it is a relatively straightforward process. Usually the victim comes forward and tells of being forced to surrender money to the robber. But identifying a hate crime requires something more: an assessment of the criminal's motive. A robbery might be a hate crime if prejudice motivates the robber, but the crimes committed by robbers with other motives are plainly not hate crimes, even if the robber and the victim are of different races.

There are real disagreements about how to define and measure hate crimes. Not surprisingly, some activists favor broad, inclusive standards that will avoid false negatives. Some feminists, for example, argue that rapes should automatically be considered hate crimes on the grounds that all rape is motivated by gender prejudice. But local officials, who may be reluctant to publicize tensions

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within their communities, may favor much narrower standards: a cross-burning on an African-American family's lawn may be classified as a teenage prank rather than as a hate crime.

Because there is much variation in how – and even whether – agencies measure hate crimes, hate-crime statistics have been incomplete and uneven. In 1991, the FBI collected hate-crime data from only 32 states; less than a quarter of all law enforcement agencies supplied reports. By 1996, 49 states and the District of Columbia reported some data, but many agencies still did not participate.

More important, many of the agencies that did file reports indicated that they had recorded no hate crimes during 1996. Twelve states reported fewer than 10 hate crimes apiece and Alabama's law enforcement agencies reported none. So long as many agencies refused to submit hate-crime statistics – and others used wildly different standards to classify hate crimes – the data collected and published would have little value. We might even suspect that the jurisdictions that report the most hate crimes will be those with the most liberal governments, because they are more likely to press law enforcement agencies to take such reporting seriously. This suggests that hate-crime statistics may be a better measure of local officials' political beliefs than of the incidence of hate crimes.

While the record-keeping may improve over time, the hate-crime statistics reported during the program's early years were nearly worthless. Practices for recording hate crimes obviously varied widely among jurisdictions, making meaningful comparisons impossible. Moreover, it should be noted that, as reporting does improve, the numbers of reported hate crimes will almost certainly increase. That is, incidents that previously would not have been counted as hate crimes will be counted and successive annual reports will show the incidence of hate crime rising. Measurement is always important, but this example illustrates why new statistical measures should be handled with special caution.

Clear, precise definitions are not enough. Whatever is defined must also be measured, and meaningless measurements will produce meaningless statistics.

Bad Samples. Earlier, I emphasized the importance of generalizing from representative samples. This is a basic principle, but one that is easily ignored.

Consider a study subtitled *A Survey of 917,410 Images, Descriptions, Short Stories, and Animations Downloaded 8.5 Million*

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Times by Consumers in Over 2,000 Cities in 40 Countries, Provinces, and Territories. An undergraduate published this research in 1995 in a law review, reporting that 83.5 percent of the downloaded images were pornographic. In 1995, the Internet was still a novel phenomenon; people worried that children were frequent users, and that parents did not understand the Internet well enough to protect their children from questionable content.

Claims that an extensive research project revealed that a substantial majority of Internet traffic involved pornography generated considerable concern. The huge scope of the study – 917,410 images downloaded 8.5 million times – implied that it must have been exhaustive.

But, of course, a large sample is not necessarily a good sample. In this case, the researcher did not collect a representative sample of Internet traffic. Rather, he examined postings to only 17 of some 32 Usenet groups that carried image files. In fact, his findings showed that pornographic images accounted for about 3 percent of Usenet traffic, while Usenet accounted for only about an eighth of the traffic on the Internet.

The sample was drawn from precisely that portion of the Internet where pornographic images were concentrated and was thus anything but representative. An alternative way to summarize the study's findings was that only one-half of 1 percent of Internet traffic involved pornographic images – a markedly lower figure than 83.5 percent.

All three cases discussed above received extensive coverage from the media; all three attracted the attention of political leaders; all three involved mutant statistics. It is also true that, in all three cases, the statistics eventually drew criticism. However, critics are not always successful in influencing the public. Many people probably remain convinced that most Internet traffic is pornographic, that members of a racist conspiracy set many church fires, and so on. The impact of mutant statistics is often long-lived.

Transformation: Changing the Meaning of Statistics

Another common statistic mutation involves transforming a number's meaning. Usually, this takes place when someone tries to repeat a number, but manages to say something different; recall that 150,000 people with anorexia became 150,000 annual deaths from anorexia.

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Of course, not all transformations are as obvious as equating having a disease with dying from it. Often transformations involve more subtle misunderstandings or logical leaps.

Consider the evolution of one social commentator's estimate that 6 percent of America's 52,000 Roman Catholic priests "are at some point in their adult lives sexually preoccupied with minors." This estimate originated with a psychologist and former priest who treated disturbed clergymen and derived the figure from his observations. It was, in short, an educated guess. Still, his claim was often repeated and, in the process, transformed in at least four important ways.

First, some of those who repeated the figure forgot that it was an estimate, and referred to the number as though it were a well-established fact – presumably a finding from a survey of priests. Second, while the psychologist's estimate was based on a sample of priests who had sought psychological treatment (and therefore might well be especially likely to have experienced inappropriate attractions to young people), he generalized to all priests. Third, although the original estimate referred to sexual attraction rather than actual behavior, those who repeated the number often suggested that 6 percent of all priests had had sexual contacts with young people. Fourth, those young people became redefined as children; commentators charged that 6 percent of priests were pedophiles. Although the original estimate in fact suggested that twice as many priests were attracted to adolescents as to younger children, this subtlety was lost.

Thus, an estimate that perhaps 6 percent of priests in treatment were at some point sexually attracted to young people was transformed into the so-called fact that 6 percent of all priests had had sex with children. Not everyone who repeated the statistic made all four transformations, but the number's original meaning soon became lost in a chorus of claims linking "pedophile priests" to the 6 percent figure.

This example suggests that it is impossible to predict all the ways a number might be misunderstood and given an entirely new meaning. While it may be especially easy to transform estimates and guesses because the language of guessing is often vague, more precisely defined statistics can also undergo transformation.

Homicide statistics offer an example. In addition to gathering reports of homicides to calculate crime rates, the FBI also tries to collect more detailed information for its supplementary homicide reports. The FBI encourages law enforcement agencies to complete a brief form for each homicide that asks, for example, about the victim's age, gender and ethnicity, the relationship between victim and offender, and the circumstances of the homicide – whether the death occurred during the course of a robbery, during an argument, and so on.

These reports are inevitably incomplete. When the police find the body of a homicide victim, they ordinarily can identify the victim's age and gender, and they often – but not always – can specify the circumstances of the homicide. But unless they identify the offender, they usually cannot know the nature of the victim-offender relationship. In such cases, the relationship is coded "unknown." Roughly 15 to 20 percent of the reports to the FBI reports list the circumstances as unknown; nearly 40 percent indicate that the victim-offender relationship is unknown.

Completing the paperwork for the FBI is a byproduct of police work and may receive a relatively low priority. Agencies are supposed to submit these reports within five days of the

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end of the month in which the homicide becomes known. While the FBI asks for updated reports when additional information becomes available, many agencies don't bother to report changes. Thus, a homicide initially reported as involving unknown circumstances or an unknown victim-offender relationship may later be solved, but the police do not necessarily report what more they have learned to the FBI.

A classification of "unknown" means just that – at the time the report was completed, the police didn't have the information. However, people sometimes make assumptions about the nature of the unknown circumstances or unknown victim-offender relationships reported to the FBI. In the early 1980s, the FBI drew attention to the problem of serial murderers. There had been several prominent serial murder cases in the news, and the press argued that this was, if not a new crime problem, at least one that was more common than ever before. The FBI estimated that there might be as many as 35 serial murderers active at any one time, and the media claimed that serial murderers might account for as many as 4,000 or 5,000 deaths per year. Some commentators mangled these numbers further, reporting that there were 4,000 to 5,000 active serial killers.

It should have been apparent that there was something wrong with these statistics. They implied that each killer murdered more than 100 victims per year – an improbably high average. How did the analysts arrive at the figure of 4,000 victims? Simple: they assumed that all – or at least a large share – of the reported homicides involving unknown circumstances or an unknown victim-offender relationship were serial murders. Serial murderers often kill victims unknown to them; therefore, those inclined to sensationalize the numbers assumed that cases in which the victim-offender relationship was unknown were probably serial murders.

Recent claims blaming most homicides on strangers use similar logic. Reports to the FBI classify about 15 percent of victims and offenders as strangers, but nearly 40 percent of victim-offender relationships as unknown. Some interpretations assumed that any unknown relationship must involve strangers. So they added 15 percent and 40 percent and concluded that strangers commit most (55 percent) of all murders.

Both the serial murder and the stranger-homicide claims transformed the meaning of "unknown" by assuming that, if the police can't classify the victim-offender relationship, then the homicide must be the work of a stranger – or even a serial killer. This is an unwarranted logical leap. Researchers who have conducted more careful studies (for example, examining officials' final classifications for homicides) have concluded that strangers account for only 20 to 25 percent of all homicides, not more than half, and that serial murderers kill perhaps 400 victims a year, not 4,000.

The lesson from the misinterpretation of these statistics, then, concerns transformations created by careless inferences about the meaning of official statistics. In these cases, observers assumed that they knew what had actually happened in cases that the police labeled "unknown." They produced dramatic, frightening figures that exaggerated the deaths caused by strangers or serial murderers, and those transformed figures were widely circulated.

Transformations involve shifts in meaning; advocates for some cause convert a statistic about X into a statistic about Y. This is an obvious error. Sometimes transformations are inadvertent, reflecting nothing more than sloppy language. In such cases, people try to

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repeat a statistic, but they accidentally reword a claim in a way that creates a whole new meaning. Of course, other transformations may be deliberate efforts to mislead in order to advance the advocates' cause.

Certainly, transformations often increase a claim's impact by making it more dramatic: the number of anorexics becomes a body count; priests attracted to adolescents become priests having sex with children; homicides of unknown circumstances become serial killings. Such statistics get repeated precisely because they are dramatic, compelling numbers. A transformation that makes a statistic seem less dramatic is likely to be forgotten, but a more dramatic number stands a good chance of being repeated. It is a statistical version of Gresham's Law: bad statistics drive out good ones.

There is another lesson here: transformation errors often reflect innumeracy. It should have been obvious that anorexia could not kill 150,000 women per year. Similarly, the people who asserted that there were 35 active serial murderers killing 4,000 victims each year should have realized that those two figures made no sense when combined, that both could not be correct.

Advocates are not the only ones to blame. The reporters who wrote stories about all those deaths from anorexia or serial murder should have asked themselves whether those numbers were plausible; they might even have investigated the claims before repeating them. Yet, in each case, these numbers received wide circulation for years – and continued to be repeated even after they were called into question. After all, the mutant statistics were now readily available; people could easily find them on the Internet or printed in many sources.

Transformation errors are thus easy to make, but difficult to set right. Transformation only requires that one person with influence over the media misunderstand a statistic and repeat the number in a way that gives it a new meaning. Even if someone recognizes the mistake and calls attention to it, the error is likely to live on.

Some statistics get mangled because they are difficult to grasp, and are therefore easily confused.

Confusion: Garbling Complex Statistics

The examples discussed so far involve misunderstanding simple, straightforward statistics. But some statistics get mangled because they are difficult to grasp, and are therefore easily confused.

Consider *Work Force 2000*, a 1987 report commissioned by the United States Department of Labor that projected changes in the

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American work force. Work-force demographics are gradually changing for several reasons; most important, a growing proportion of women work, so females account for a growing percentage of workers. In addition, the percentage of workers who are nonwhite is growing, a fact that reflects several developments, including immigration patterns and ethnic differences in birth rates. The combined effect of these changes is gradually reducing the proportion of white males in the work force. In 1988, when *Work Force 2000* appeared, white males accounted for 47.9 percent of all workers, and the report projected that, by 2000, this percentage would fall to 44.8 percent.

However, rather than describing the change in such easily understood terms, the report's authors chose to speak of "net additions to the work force." The report predicted the populations of workers that would enter and leave the work force (because of death, retirement and so on) between 1988 and 2000. For example, the authors estimated that 13.5 million white males would join the work force and 11.3 million would leave. The difference – 2.2 million – would be white males' "net addition to the work force" Because the numbers of female and nonwhite workers are growing faster than those of white males, white males made up a relatively small share – less than 15 percent – of the anticipated total net addition to the work force.

Rather than describing the gradual decline in white males' proportion of the work force in terms of a straightforward percentage (47.9 percent in 1988, falling to 44.8 percent in 2000), the authors of *Work Force 2000* chose to use a more obscure measure (net additions to the work force). That was an unfortunate choice, because it invited confusion. In fact, it even confused the people who prepared the report. *Work Force 2000* came with an executive summary for those too busy to read the entire document. The summary mangled the report's findings by claiming that "only 15 percent of the new entrants to the labor force over the next 13 years will be native white males, compared to 47 percent in that category today." That sentence was wrong for two reasons. First, it confused net additions to the labor force (expected to be roughly 15 percent white males) with all new entrants to the labor force (white males were expected to be about 32 percent of all those entering the labor force); and, second, it made a meaningless comparison between the percentage of white males among net work force entrants and white males' percentage in the existing labor force (roughly 47 percent). The statistical comparison seemed dramatic, but it was pointless.

Unfortunately, the dramatic number captured people's attention. The press fixed on the decline in white male workers as the report's major finding, and began to repeat the error. Officials at the Department of Labor

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tried to clarify its meaning, but the mutant statistic took on a life of its own. Politicians, labor and business leaders, and activists all warned that the workplace was about to undergo a sudden change – that white males were an endangered species.

The mangled statistic was itself remangled; for example, one official testified before Congress that by "the year 2000, nearly 65 percent of the total work force will be women," yet no one asked how or why that might occur.

It is easy to see why people repeated these claims. The notion that white males would soon become a small proportion of all workers offered support for a variety of political ideologies. Liberals saw the coming change as proof that more needed to be done to help women and minorities – who, after all, would be the workers of the future. Liberal proposals based on *Work Force 2000* called for expanded job training for nontraditional (that is, nonwhite or female) workers, additional programs to educate management and workers about the need for diversity in the workplace, and so on.

In contrast, conservatives viewed the changing work force as further evidence that immigration, feminism and other developments threatened traditional social arrangements. In response to claims that white male workers were disappearing, a wide range of people found it easier to agree ("We knew it! We told you so!") than to ask critical questions about the statistical claims.

The reaction to *Work Force 2000* teaches a disturbing lesson: complex statistics are prime candidates for mutation. Not that the statistics in Work Force 2000 were all that complex. But the meaning of "net additions to the work force" was not obvious, and when people tried to put it in simpler language – such as "new workers" – they mangled the concept.

The report's authors ought to have realized that most people would not grasp this relatively complicated idea. And, of course, the people who interpreted the report (beginning with the authors of the executive summary) unintentionally mangled it to produce figures with new, wildly distorted meanings. Thus, a correct but difficult-to-understand statistic became an easy-to-understand but completely wrong number.

Similar confusion characterized press coverage of a medical study supposedly showing that doctors referred blacks and women for cardiac catheterization less often than whites and men. In the study, researchers gave doctors information (e.g., descriptions of chest pain and results of stress tests) about fictional patients who were described as either black or white, female or male. The doctors were asked how they would treat these patients, and the researchers examined which kinds of patients were referred for cardiac catheterization. Interestingly, white women, black men, and white men were equally likely to receive referrals for the procedure: catheterization was recommended for 90.6 percent of the patients in each group. In contrast, only 78.8 percent of black women were referred for catheterization.

This study attracted considerable press coverage when the media summarized the results as showing that blacks and women were 40 percent less likely to receive cardiac testing. How could the press produce this mangled statistic from these data?

The answer lies in the researchers' decision to report their results in terms of odds ratios. Producing this statistic involved a two-stage calculation. First, the researchers calculated the odds of people in different groups being referred for catheterization. Remember that 90.6 percent of white women received referrals; this means that, among 1,000 white

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women, 906 would get referrals, and 94 would not; therefore the odds of a white woman being referred were 9.6 to 1 (906 referrals/94 non-referrals = 9.6). That is, for every white woman not referred, 9.6 would be referred.

Black men and white men had the exactly same percentages of being referred, and therefore the same odds of referral. But the odds of black women being referred were only 3.7 to 1. Among 1,000 black women, there would be 788 referrals and 212 non-referrals. Thus for every black woman not referred, 3.7 would be referred.

Notice that when white men and white women are grouped together, both sexes had the same rates of referral and the same aggregate odds – 9.6 to 1. However, when black men (who had the same rate of referral as whites) were combined with black women (who had a lower rate of referral), the overall odds for all blacks were lower – 5.5 to 1. Similarly, the aggregate odds for all men (black and white) were higher than the aggregate odds for all women.

So far, we have been talking about the odds of being referred for cardiac catheterization. But the researchers reported the odds ratios. This slightly more complicated statistic involves a second stage of calculation. For example, the ratio of the odds of men being referred (9.6) to the odds of women being referred (5.5) is 1 to 0.6 (5.5/9.6 = 0.6). Similarly, the ratio of the odds of whites being referred (9.6) to the odds of blacks being referred (5.5) is 1 to 0.6. Odds ratios, like net additions to the work force, are statistics that lack intuitive meaning. Most people don't think in terms of odds ratios, nor do they understand what the term means.

Certainly, this was true for the reporters who announced that blacks and women were only 60 percent as likely to receive heart testing as whites and men were. They misunderstood the odds ratio (0.6) to mean the relative likelihood of receiving the procedure. The correct comparison would have involved calculating the risk ratios – that is, figuring the relative chance, or risk, of being referred for testing.

If 90.6 percent of whites and 84.7 percent of blacks are referred, then blacks are 93 percent as likely (84.7/90.6 = .93) to get referrals. That is, blacks were 93 percent as likely to be referred as whites, and women 93 percent as likely as men. Blacks and women, then, were not 40 percent less likely to receive referrals; they were 7 percent less likely to be referred.

As in the case of *Work Force 2000*, the misinterpretation began by mangling a poorly understood statistic. Reporters tried to translate the unfamiliar notion of odds ratios into more familiar statements of probability, and their resulting claims were simply wrong.

Two other aspects of this case deserve mention. First, the researchers' decision to compare grouped data for men and women (and blacks with whites) distorted their findings. Remember that white men, black men, and white women had exactly the same rates of referrals. The use of aggregate comparisons obscured the real pattern (that only black women were referred at lower rates). Rather than suggesting that all women or all blacks were less likely to receive referrals, the researchers should have emphasized that black women received different recommendations from all other patients.

Second, we might wonder about the significance of receiving those referrals. The press reports simply assumed that referrals for cardiac catheterization (an invasive medical procedure that carries its own risks) were always appropriate, in effect implying that every patient should have received a referral. But this may be wrong. Perhaps the study showed that physicians were too quick to refer men

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and white women for a risky procedure. But the press reports never considered this possibility. The press also tended to forget that the doctors in this study were examining fictitious files, not treating real patients.

The ease with which somewhat complex statistics can produce confusion is troubling because we live in a world in which complex numbers are becoming more common. Simple statistical ideas – fractions, percentages, rates – are reasonably well understood by many people. But many social problems involve complex chains of cause and effect that can be understood only through complicated models. Thus, current understandings for why some people develop heart disease or cancer assume that heredity plays a part, that various behaviors (diet, exercise, smoking and so on) play roles, and that the environment has an influence. Sorting out the interconnected causes of these problems requires relatively complicated statistical ideas – net additions, odds ratios and the like. If we have an imperfect understanding of these ideas, and if the reporters and other people who relay the statistics to us share our confusion, the chances are good that we'll soon be hearing – and perhaps making decisions on the basis of – mutated statistics.

The ease with which somewhat complex statistics can produce confusion is troubling because we live in a world in which complex numbers are becoming more common.

Compound Errors: Creating Chains of Bad Statistics

Bad statistics often take on a life of their own. Rarely criticized, they gain widespread acceptance, and they are repeated over and over. Each repetition makes the number seem more credible. And, of course, bad statistics can become worse through mutation. But that's not the end of the process. Bad statistics can have additional ramifications when they become the basis for calculating still more statistics.

We can think about this process as compounding errors into a chain of bad statistics; one questionable number becomes the basis for a second statistic that is, in turn, flawed. The process can continue as the second bad number leads to a third, and so on.

Consider some of the uses to which the Kinsey Reports have been put. During the 1930s and 1940s, the biologist Alfred Kinsey

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and his colleagues conducted lengthy interviews with several thousand people about their sexual experiences. These interviews became the basis for two books, *Sexual Behavior in the Human Male* (1948) and *Sexual Behavior in the Human Female* (1953), that are popularly known as the Kinsey Reports.

The books challenged the polite fiction

that most sex was confined to marriage; they revealed that many people had experience with a wide range of sexual behaviors, such as masturbation and premarital sex. However, the Kinsey data could not provide accurate estimates for the incidence of different sexual behaviors. While the interviews constituted a large sample, that sample was not representative, let alone random. It contained far more college-educated people than there were in the general population and, in an effort to explore a broad range of sexual experiences, Kinsey deliberately arranged interviews with a substantial number of active homosexuals, as well as many people who had been imprisoned.

Nonetheless, commentators sometimes treat the Kinsey findings as though they offer an authoritative, representative portrait of the American population. For example, gay and lesbian activists sometimes argue that one-tenth of the population is homosexual, and they refer to the Kinsey Reports to support that claim.

Rather than define heterosexual and homosexual as a simple dichotomy, the Kinsey Reports described a continuum that ranged from individuals who had never had a homosexual experience to those who had some incidental homosexual experiences to those whose sexual experiences had been exclusively homosexual. Still, the male report estimated that "10 percent of the males are more or less exclusively homosexual... for at least three years between the ages of 16 and 55." Later surveys, based on more-representative samples, have concluded that 3 to 6 percent of males (and a lower percentage of females) have had significant homosexual experience, and that the incidence of homosexuality among adults is lower – between 1 and 3 percent. However, gay and lesbian activists often dispute these lower estimates; they prefer the one-in-ten figure because it suggests that homosexuals are a substantial minority – roughly equal in number to African-Americans in the United States – who form a group too large to be ignored. Thus, the 10 percent figure lives on, and it is often used in calculating other new statistics about

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gays and lesbians. Consider, for example, claims that one-third of teenage suicides – or roughly 1,500 deaths a year – involve gay or lesbian adolescents. Gay activists invoke this statistic to portray the hardships gay and lesbian youth confront. It suggests that stigma and social isolation are severe enough to drive many adolescents to kill themselves.

But how could anyone hope to measure gay teenage suicides accurately? Many gays and lesbians try to conceal their sexual orientation, and some teenagers might have been driven to suicide because keeping that secret was becoming a burden. But, given this secrecy, how could anyone know which teenagers who commit suicide are gay or lesbian?

So how did advocates arrive at the statistic? They constructed a chain of bad statistics. They began with the familiar, Kinsey-based claim that one-tenth of the population – including, presumably, one-tenth of teenagers – is homosexual. Roughly 4,500 teenage deaths are attributed to suicide each year; on average, then, 10 percent of those – 450 suicides – should involve gay or lesbian teens. (Note that we have already incorporated our first dubious statistic: that 10 percent of the population is gay or lesbian.)

Next, advocates drew upon various studies that suggested that homosexuals attempted suicide at two to three times the rate of heterosexuals. Note that this figure presumes knowledge about the rates of an often-secretive behavior in two populations – one itself often hidden. Multiplying 10 percent by three led to an estimate that gays and lesbians accounted for 30 percent of suicides – and this figure was in turn rounded up to one-third. Thus, one-third of 4,500 teenage suicides – 1,500 deaths – involve gay or lesbian youths.

Notice how the final figure depends on the proponents' assumptions. If the proportion of homosexuals among all teenagers is estimated at 3 percent, or 6 percent, the number of gay teenage suicides falls. If the rate at which homosexual teens commit suicides is only twice that of heterosexuals, the number falls.

This example offers two important lessons. The first is a reminder that bad statistics can live on. Most social scientists consider Kinsey's 10 percent estimate for homosexuality too high. Yet some gay and lesbian activists continue to cite it precisely because it is the largest available number. In turn, 10 percent often figures into other calculations – not just about gay teenage suicides, but estimates of the number of gay voters, the size of the gay population at risk of AIDS, and so on.

The second lesson is perhaps harder to learn. Any claim about the number of gay teenage suicides should set off alarm bells. Given the difficulties in learning which deaths are suicides and which teenagers are gay, it obviously must be hard to learn the number of gay teenage suicides. It is not unreasonable to ask how the advocates arrived at that number, and which assumptions lay behind their calculations. But, of course, such examinations are the exception, not the rule.

Compound errors can begin with any of the standard sorts of bad statistics – a guess, a poor sample, an inadvertent transformation, perhaps confusion over the meaning of a complex statistic. People inevitably want to put statistics to use, to explore their implications. An estimate for the number of homeless people can help us predict the costs of social services for the homeless, just as an estimate of the proportion of the population that is homosexual lets us predict the number of gay and lesbian teenagers who may attempt suicide. But when the original numbers are bad, compound errors can result. Assessing such statistics requires another level of critical

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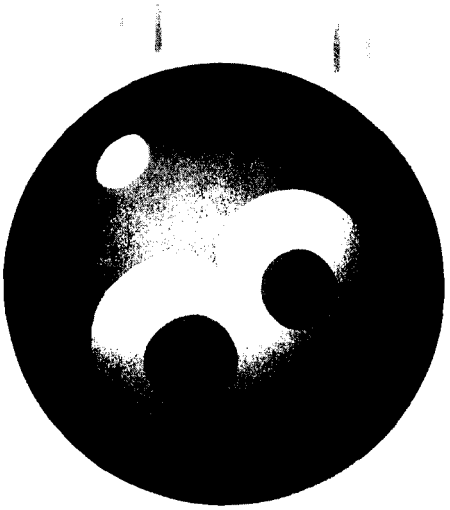

tracing the history of a number, and learning how its meaning or use changes over time. Mutant statistics don't always start out bad. Although a bad statistic often provides an excellent basis for mutation, even good statistics can be mangled into bad mutations.

Mutant statistics are not necessarily evidence of dishonesty. Many advocates are perfectly sincere, yet innumerate. Their conviction that the problem is serious and that they need to make that seriousness clear to others, coupled with their misunderstanding of what the numbers actually mean, provides the foundation for many of the sorts of errors detailed here.

However, there is also deliberate manipulation – conscious attempts to turn statistical information to particular uses. Data can be presented in ways that convey different impressions, and it is not uncommon for advocates to selectively choose which numbers they report, and to pick the words they use to describe the figures with care. That is, the numbers are selected because they promise to persuade, to support the advocates' positions.

Drama ensures repetition, while innumeracy discourages critical thinking.

thinking; one must ask both how advocates produced the statistic at hand (1,500 gay teenage suicides), and whether they based their calculations on earlier numbers that are themselves questionable (e.g., 10 percent of the population is homosexual).

THE ROOTS OF MUTANT STATISTICS

Detecting mutant statistics often requires

Whether they are sincere or cynical, advocates prefer dramatic statistics, numbers that make the problem seem as serious, the need as urgent, as possible. If, through transformation or confusion or compound error, they devise a mutant statistic that happens to be more dramatic than some original figure, there is a good chance that the mutation will spread. Drama ensures repetition, while innumeracy discourages critical thinking. ■

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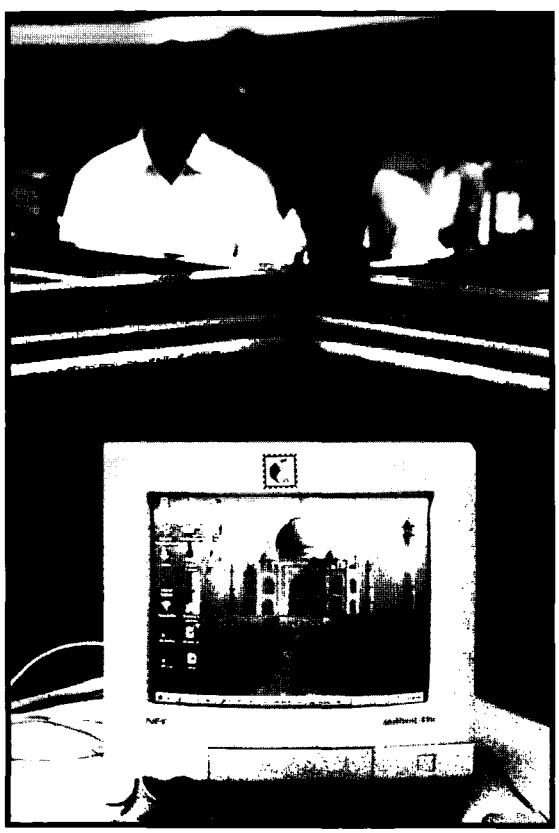
BY MARSHA VANDE BERG

India and China,

with their fierce nationalism, technological ambitions and combined population of more than two billion, cast giant (if ill-defined) shadows over the global economy. And nowhere is the relationship between India and China as uneasy neighbors and natural competitors more evident than in the software industry.

India holds the lead, facilitated by an early start, an education system that understands how private enterprise works and a timely boost into the international big leagues as the leading provider of Y2K-bug fixes. New Delhi is forecasting that the output of the country's information technology sector will reach $140 billion by 2008 – on the order of one-third of today's entire GDP. This year, software exports are expected to be $6 billion, a 47 percent increase over last year and about six times China's exports of software.

China, bold, aggressive and hungry for recognition of its past and future greatness, is unwinding bits and pieces of its software sector from government controls. In the short term, reformers anticipate the moves will enable China to take advantage of an industrywide shift toward cheaper sources of supply in technology services. In the long term, they hope a thriving information technology sector can serve as a buffer to the economic dislocation that is inevitable in the wake of entry to the World Trade Organization.



SAVITA KIRLOSKAR/REUTERS/TIMEPIX

One ironic consequence is that China, which has outpaced India in economic growth for half a century, has begun looking to India as a role model. This makes Indians nervous. Some worry that China will become a cheap-

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er alternative for the West in the accelerating race for software outsourcing. Others acknowledge the developing competition, but hope to use it to press New Delhi for deregulation that allow information technology to grow even more rapidly.

In May, B.V. Naidu, head of the Software Technology Parks of India, joined the chorus of those who see China's information technology threat in nationalist terms. After returning from a major technology fair in Beijing, he told *The Times of India* that China's goal is "to overtake India. They made it very clear in the exhibition (with a) signboard that read: 'Our aim is to become the future Bangalore of China.'"

Not everyone sees China's success in zero-sum terms. "China is not competitive yet," explains technology analyst George Koo of Deloitte & Touche in San Jose. "India is entrenched – and the Chinese are just beginning. Rarely does this kind of circumstance produce companies in the same space bidding on the same contract."

But give the Chinese information technology sector five years – or less – to catch up, and the ballgame has a chance at evening up. "Things in high tech move very quickly," Koo reminds.

John Chen, president and CEO of Sybase, a software manufacturer in Emeryville, Calif., that does business in both India and China, takes a long view, too. "The Chinese could be competitive," he says, "but right now, the needs are so huge globally, there is enough work to go around." The larger problem is one of available talent – in Asia and the West.

Kanwal Rekhi, president of Indus Entrepreneurs, an advocacy group for Indian entrepreneurs in Silicon Valley and in India, is likewise sanguine about the budding competition. Still, he says, "India should always be nervous about the Chinese." Rekhi is old enough to remember that Chinese soldiers marching into India during the 1962 Sino-Indian border war – a conflict that remains unresolved to this day.

China's goal is "to overtake India. They made it very clear in the exhibition (with a) signboard that read: 'Our aim is to become the future Bangalore of China.'"

It is unlikely the Chinese could succeed in surpassing India's breadth and depth in software anytime soon, Rekhi argues. Many Indians speak English, he notes, and they grow up in a culture that nourishes individual initiative: "I don't see any danger of losing our position."

The voluble Rekhi is, by the way, one of Silicon Valley's best-heeled philanthropists. He sold his company in 1989 to Novell for $210 million and now supports Indian entrepreneurship through TiE, educational programs and a lot of venture capital seed money.

The China-India competition in software has implications for United States policy. Washington supports a policy of political and economic engagement with both countries. At the same time, the Bush administration has shown signs it sees India as a counterweight to Chinese power in Asia. The long-

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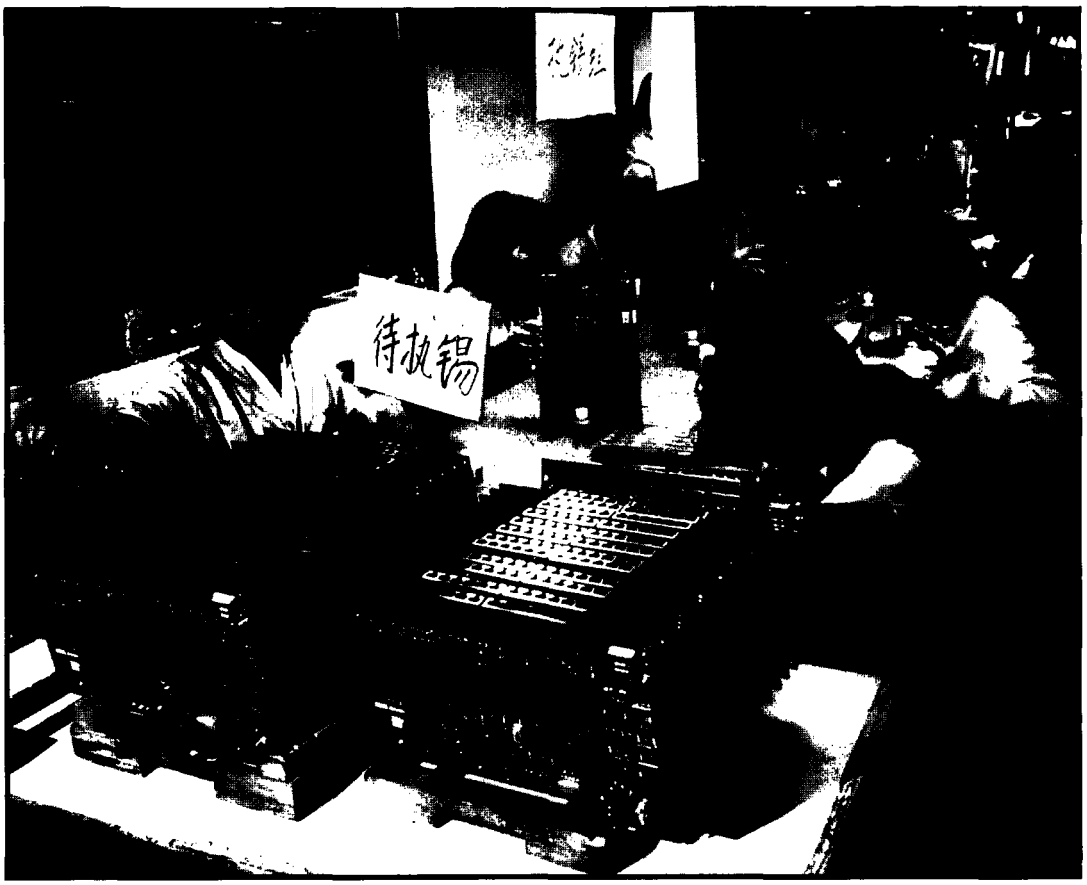

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standing concern for United States policymakers is that China's economic rise fuels a growing military might and a widening of ambitions regionally.

Typically, software represents only 15 percent of the information technology pie in market value – content is about 80 percent and hardware the remainder. But software remains the darling of advanced industrial economies because of its central importance in promoting knowledge-based industries and, more generally, competitive technological change.

According to Chen, hardware has a different "personality." Hardware contributes to GDP, but the sort of business infrastructure that goes with software production is more likely to spur innovation and growth. "The Chinese government is encouraging its software sector because it sees a chance to leapfrog" out of its current status. They have the people. They just have to train them, says Chen.

Beijing acknowledges its short supply of expertise when it comes to developing software and related services. According to IDC, the research group, the computer education and training market in China is expected to grow by 40 percent annually. But that's from a trivial base: it was just $116 million in 1999. To accelerate the process, the government is promoting two-year certificate programs as an alternative to the traditional route of getting a university degree. Two-year programs

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offer practical education and the chance to learn specific skills. This represents a change in attitude by both the government and students, says Chen.

Beijing is also allowing foreign firms to invest in its training programs. The benefit for companies like Sybase is access to a pool of graduates who are prospective employees. Other American companies with links to Chinese training centers include Oracle, Microsoft, IBM, Intel and Cisco Systems.

India's big information technology training firm, NIIT, is also a part of this picture. NIIT opened its first Chinese computer education program center in 1998 in Shanghai, then teamed up with Robert Kuok and his TVE International to branch out on the mainland.

Institutions don't drive this process, the practitioners do, insists Rekhi. "The people who are in place" must be given a wide berth to build on their collective experience, drive the process of innovation and grow the field, he says. "That's why a great leap forward is not possible." Working in software is like groping in the dark until, suddenly, an idea stands out. "You don't get to that point because 1,000 flowers are allowed to bloom." At the core must be a conscious decision to let brainpower, not government, lead development, he adds.

Training and education, plus a proclivity for English as a second language, are at the core of India's strength in software. The six branches of the Indian Institutes of Technology (IIT) stand out in an otherwise perennially underfunded education system. Indeed, many of the success stories in Silicon Valley and elsewhere in the world are products of IIT.

The Indian information technology stars on the Bombay and New York stock exchanges are Infosys, Satyam and Wipro, all of which specialize in outsourcing services for Western multinationals. Infosys and Wipro rank with 10 other Indian-based companies among the top 21 software companies worldwide, according to the Carnegie Mellon Software Engineering Institute.

Indian firms can now claim one-fifth of the world market in customized software. They are deeply engaged in the United States as well as in the Mideast.

Collectively, Indian firms can now claim one-fifth of the world market in customized software. They are deeply engaged in the United States as well as in the Mideast, where oil revenues are getting invested in technology upgrades. They've also targeted Southeast Asia – Singapore, in particular – as a partner in infrastructure projects furthering information technology development. They began their climb up the software value chain unhampered for the most part by India's implacable bureaucracy and proclivities toward a "license raj" – a taste for central planning so all-encompassing that, by comparison, Leonid Brezhnev was a cowboy capitalist.

Things were not always this way. It took a team, including Rekhi, to lobby the government hard for relief from the grip of the

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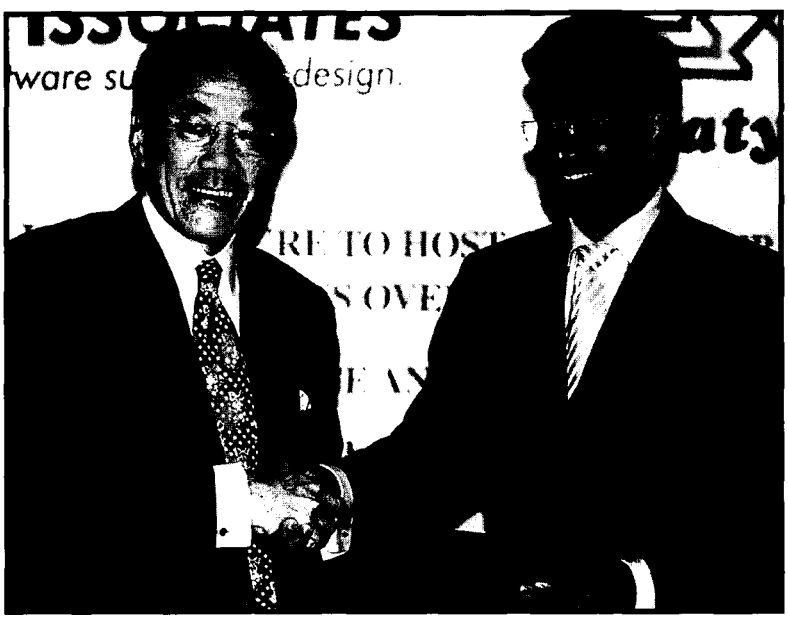
byzantine regulatory structure. The governing coalition, in place since 1998, responded by taking its hands off the sector.

The government set in motion deregulation of the telecom industry and then loosened its hold on the construction of the Internet backbone. This allowed Bharti Telecom to team up with Singapore Telecom to lay nearly 22,000 miles of optical fiber to link up India's smaller networks. The duo also is laying a sophisticated submarine cable spanning the Indian Ocean. It is expected to reach the city of Chennai in southeast India sometime next year and then extend to a total of 10 cities by year's end.



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T.G. Ramesh, the cofounder of Bangalore Lab, explained to one Indian newspaper: "give Bangalore bandwidth, and you have a services revolution." He might have said the whole of India.

In China, the infrastructure buildout is proceeding along a path similar to that pursued in 1991 in India, when the central government authorized construction of more than a dozen software technology parks. Beijing's daisy chain of tech parks is being constructed in urban areas designated for technology development. The effort plays to China's stronger hardware suit, as well as to China's intention to develop its software sector. Two of the best-known parks are the Zhongguancun Science and Technology Center in Beijing and the Shanghai Pudong Software Park in Shanghai. According to Dong Tao, a senior regional economist with Credit Suisse First Boston in Hong Kong, "In 10 years, China will be the world's largest producer of information technology hardware."

Along the 45-mile corridor between Shanghai and Suzhou that is famous for its dynastic-era gardens, Logitech International, a Swiss company, assembles more than one-third of the mice used in personal computers worldwide. Soon, nearly every type of computer component will be made in this region around the Yangtze delta, fueled in large part by Taiwanese investors looking to contain rising labor costs and to capture a share of the growing domestic Chinese market.

In the last two years, some $10 billion has poured into the mainland from Taiwan, a modest acceleration of the rate of the past decade. Last year, according to *The New York Times*, cross-strait trade reached $30 billion, making Taiwan the sixth-largest trading partner of China. "That's the direction things are going," says Koo. "It's as natural as water flowing downhill. Business goes to where the costs

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are the lowest."

Still, at least two major drawbacks stand in Beijing's way. One is a dubious claim to the second-highest rate of software piracy on the planet – a problem that reflects the government's casual attitude toward intellectual property rights. (Vietnam gets first prize.) According to the Business Software Alliance, a trade group representing software enterprises worldwide, the industry absorbed $11.8 billion in losses due to piracy last year. Of that total, $1.12 billion was lost in China.

Another drawback is the scarcity of private capital to underwrite what Silicon Valley's Rekhi calls the ideas that get discovered while groping in the dark. Last June, there was at least one sign that reformers intended to get serious about this issue. Wang Wenjing, a 36-year-old programmer, got permission to raise capital for his software company, UFSoft, by selling shares on the Shanghai Stock Exchange. It is an encouraging sign, Wang told *The New York Times*. "Private companies are growing, and the environment for raising capital is getting better and better."

The achievements of both the Indian and the Chinese economies have been considerable since Deng Xiaoping abandoned socialist orthodoxy in the late 1970s and reforms began in India in 1991. Today, both economies are realizing larger growth rates than the West, and both have put some distance from the wretched economic circumstances of the post-World War II era.

Both now attract sizable chunks of foreign investment, although China continues to receive the lion's share and is likely to do even better as accession to the WTO comes closer. Likewise, both are major beneficiaries of technology transfers from the West. The result is that the software sectors in both have been able to move out front in efforts to be competitive at home and abroad.

E-commerce is also growing, along with use of the Internet, but from pitifully small bases: the China Data Network Service, the leading domain service provider, reports some 20 million individual registered Internet users, just 1.3 percent of China's population. In India, the Indian Market Research Bureau estimates that 1.1 million people have Internet subscriptions – about 0.1 percent. A tiny fraction of this tiny fraction have high-speed connections.

Usage is concentrated in the better-off urban areas in both countries. And while Internet penetration is growing faster in the world's largest democracy, many Indians still feel their hands tied by a large bureaucracy with a deep affection for the status quo.

In China, party boss Jiang Zemin assumed Deng's reform agenda when he took over after the crackdown on Tiananmen Square in June 1989. Together with Prime Minister Zhu Ronghii, he has helped redefine the economy's central tenet of state ownership. Still, the leadership in the Chinese Kremlin remains unwilling or unable to overcome ideological inertia standing in the way of all-out economic reform.

But change also happens incrementally. Dewant Mehta, the popular and passionate advocate for India's high-tech sector who was the head of the National Association of Software and Services Companies until his death last spring, characterized the relationship between the two Asian nations and their aspirations for greatness in technology this way: "There's competition and there's also cooperation. ... With the Chinese, we're looking at both. We're happy about China doing well. It challenges us to keep ahead. It also helps me lobby the Indian government. I say, 'China is doing this; we have to do that.' And things get done." M

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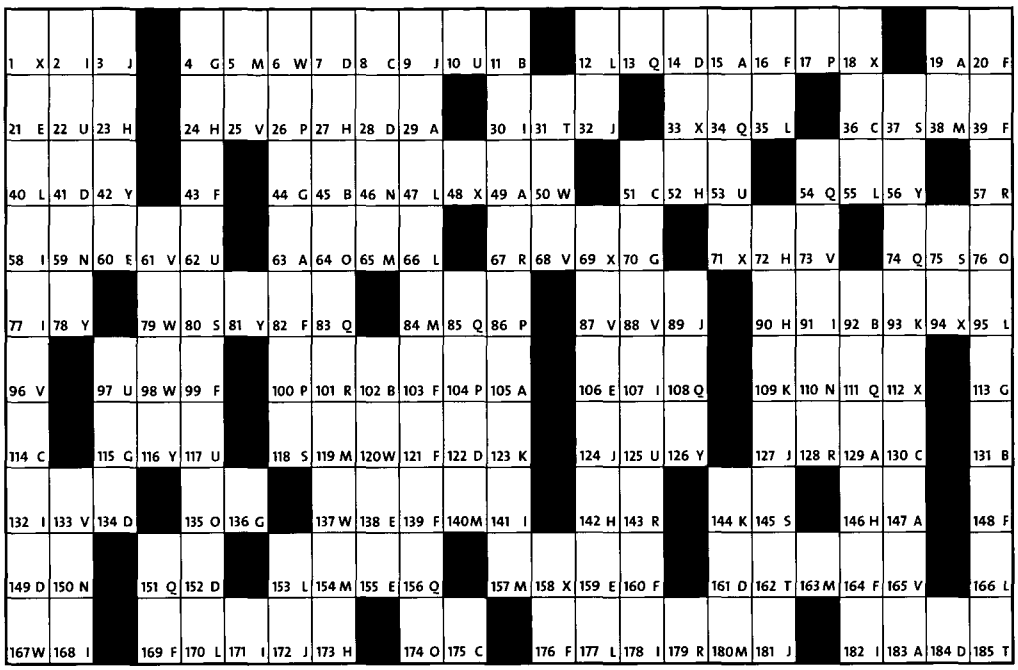
BY STEVEN POSTREL



After answering each clue, copy the letters to the corresponding numbers in the grid, where they will form a quotation. Words begin and end at shaded squares, and so may continue from one row to the next. The first letters of each answer, when spelled in order, give the author and publication of the quotation.

Answers on page 91

A. Yellow flowers ___ ___ ___ ___ ___ ___ ___ ___ ___

B. Hipster for "of course" ___ ___ ___ ___ ___

C. Annoyed ___ ___ ___ ___ ___ ___

D. Author of "The Man Who Was Thursday"

___ ___ ___ ___ ___ ___ ___ ___ ___

E. Easter figure ___ ___ ___ ___ ___ ___

F. Like the Hindenberg (3 words)

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

G. Tuba sound ___ ___ ___ ___ ___ ___

H. "...let it be Lowenbrau" (2 words)

___ ___ ___ ___ ___ ___ ___ ___ ___

I. Orthodox fast-food need (3 words)

___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

J. Dig in ___ ___ ___ ___ ___ ___ ___ ___

K. Himalayan legend ___ ___ ___ ___

L. Clueless pig (2 words) ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

M. Madonna and Cleopatra, e.g. (2 words)

___ ___ ___ ___ ___ ___ ___ ___ ___ ___

N. Tubers ___ ___ ___ ___

O. Galba's successor ___ ___ ___ ___

P. Citified ___ ___ ___ ___ ___

Q. Horned herbivore ___ ___ ___ ___ ___ ___ ___ ___ ___ ___ ___

R. Result ___ ___ ___ ___ ___ ___

S. Range ___ ___ ___ ___ ___

T. Resistance unit ___ ___ ___

U. Strut ___ ___ ___ ___ ___ ___ ___

V. Microwave generator ___ ___ ___ ___ ___ ___ ___ ___ ___

W. Olympian ___ ___ ___ ___ ___ ___ ___

X. Spins ___ ___ ___ ___ ___ ___ ___ ___

Y. Carnaby Street icon ___ ___ ___ ___ ___ ___

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BY GLENN YAGO AND THOMAS HALL

Opacity is a bloodless term. So, too, are "corporate governance," "systemic risk" and "financial disclosure." All of these terms are really about economic conditions that can lead to sustained growth, which occurs only when markets are transparent and all of the productive forces in the economy – investors, entrepreneurs, workers and consumers – share the information necessary to invest their financial, human and social capital effectively.

Economies that operate above the heads and behind the backs of their own citizens are unlikely to sustain growth, and are most likely to fall victim to periodic banking crises, financial meltdowns and capital flight. With inadequate domestic savings rates to fund future investments, emerging market countries face skeptical foreign investors unwilling to return to the killing fields of plundered capital. During the closing years of the last century, in some former Soviet republics, Latin American countries and still-crouching Asian tigers, the forced savings of citizens disappeared overnight, assets were airlifted abroad, and the pendulum of boom and bust swung ever more brutally. It's no wonder that governments destabilized and the social fabric of traditional solidarity in developing nations wore exceedingly thin.

Together with Professor Shang Jin-Wei of Harvard University, Milken Institute economists drilled deeply into a new international survey conducted by PricewaterhouseCoopers. The O-Factor Index (or Opacity Index) measures, for the first time, the hidden costs of institutional failure to provide the information necessary to assess and price country, market and corporate risk for projects and businesses worldwide. Opacity is the lack of clear, accurate, formal and widely accepted practices in the capital markets and national economies. Opacity poses an obstacle to economic progress, and where it exists, there are lost opportunities. We have found that opacity deters international capital flows, diverts investment, levies a hidden tax on domestic and foreign investors, raises the risk premium on sovereign government bonds, and exacerbates income inequality. The real lessons of the Asian and Russian financial crises are not captured by IMF finger-wagging against financial mischief, but rather by the real costs imposed upon all the developing world in financing the future. The Opacity Index quantifies these costs.

The Index defines opacity more broadly than related studies from other distinguished organizations that research various aspects of

GLENN YAGO is director of capital studies for the Milken Institute. TOM HALL is a research associate in the Milken Institute's capital studies group.

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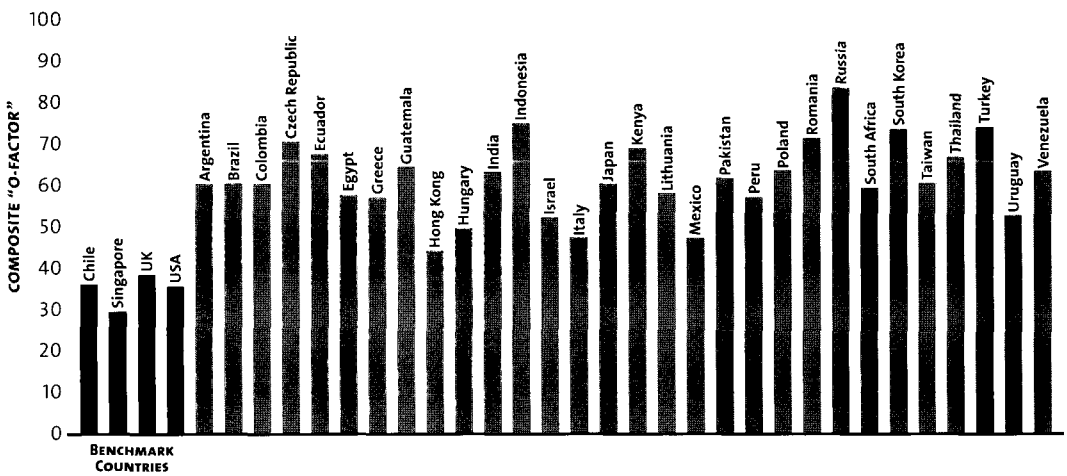
opacity. The Index defines opacity as a lack of transparency in five distinct areas: Corruption, Legal, Economic policies, Accounting and Regulatory – creating the acronym CLEAR.

In a compelling narrative detailing his experiences in development economics, Hernando de Soto's important new book, *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else* (Basic Books, 2000) echoes these themes of the costs of opacity. He estimates that the poor in the third world hold more than $9.3 trillion worth of property that avails them little or nothing because of the absence of institutional protections of property rights and the ability to construct secondary markets. Ownership, the most basic information about property, is not established in much of the developing world. Property can only provide security if it can become a means of obtaining credit in order to generate further investment.

Physical assets (not to mention the intellectual or organizational assets also untapped in the developing world) can only be converted into capital to produce and compound economic growth when it exists, is measured and can be traded in a market protected by laws and regulations. Countries that adopt corporate disclosure laws and reduce opacity – both in the private sector and in the policy/regulatory arenas – will likely increase the quantity of investment and reduce its cost.

FINANCIAL MARKET OPACITY



Plentiful capital at reasonable cost spurs a deep and healthy financial sector, and creates more income and wealth. Transactional trust in commerce and investment enables requisite uncertainty to be priced as risk. Bond rating agencies, real estate appraisers, insurance companies and credit analysts can all quantify, measure, monitor and manage risks that are disclosed. But hiding information creates hidden costs that overwhelm developing economies far beyond normal business costs and risks.

THE CASE OF LATIN AMERICA

All of the CLEAR dimensions coincide in

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financial markets. The chart opposite shows three measures of financial sector size in Latin American economies – size being a standard proxy for a more elusive "depth" of financial markets. The least opaque country in the region, Chile, dominates in terms of equity market capitalization and total banking assets, each expressed as a percentage of GDP. Argentina and Brazil lag behind.

Statistical analysis confirms a negative correlation between financial depth and both accounting opacity and corruption: the more corruption and accounting opacity, the shallower the financial markets. Opacity deters the development of financial sectors, which in turn, decelerates growth.

Skeptics argue that economic growth in and of itself is not enough to generate equitable long-term development in Latin America. Indeed, they would contend strong growth rates would only exacerbate inequality. A closer look, though, suggests they are almost certainly wrong.

Imagine a country with a high level of inequality and a small financial sector. In such a country, the financial sector is likely to function through "crony capitalism," with scarce credit allocated on the basis of personal relationships rather than the objectively analyzed risks and rewards of proposed investments. What's more, the resources left after the inner circle is satisfied are likely to be allocated in ways that ignore the needs of people outside of what de Soto calls the "bell jar" – the closed circle of players who dominate the country's wealth.

But as financial depth increases (because of increased transparency), more resources are allocated to projects offering the best returns. Better-managed companies with profitable prospects will attract more capital. If this dynamic prevails, inequality should decline, at least initially, because such enterprises stimulate the development of a middle class. If such a class becomes a major buyer of securities (either as individual investors or through mutual and pension funds, as in Chile today), then policies promoting transparency may become popular as well. The result can be a virtuous circle of transparency, development and international openness.

The more corruption and accounting opacity, the shallower the financial markets. Opacity deters the development of financial sectors, which in turn, decelerates growth.

Using a sample of countries in Latin America and data for the period 1965-99, we have found that financial development reduces income inequality. Controlling for the level of per capita income, these societies have achieved broader income distributions as national financial markets have deepened. Greater transparency across the five CLEAR dimensions accelerates this welcome trend.

Too often, bidding wars break out between developing countries competing for foreign investment on the basis of generous tax incentives. Even if countered by increasing tariffs on imported consumer goods, this strategy can cause a decline in government revenues, and it will certainly distort the allo-

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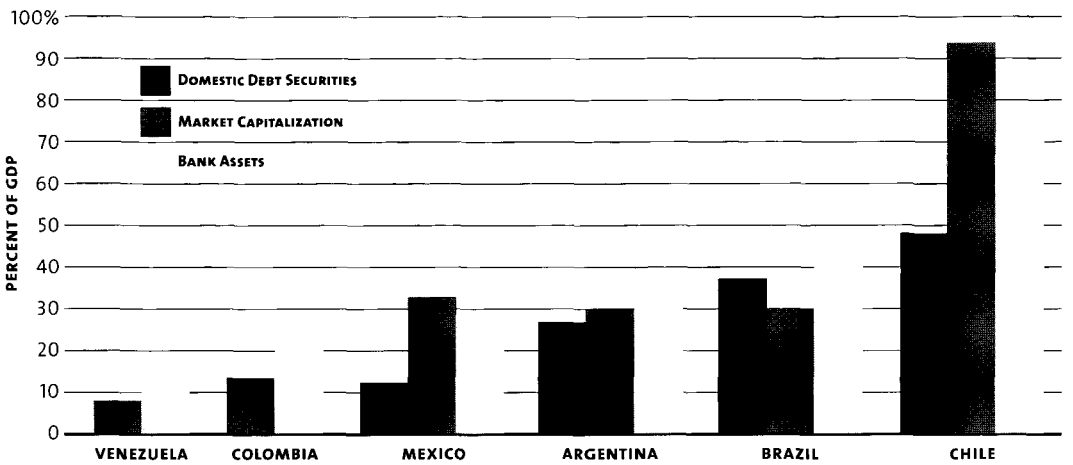
STRUCTURE OF FINANCIAL MARKETS LATIN AMERICA
(AS A PERCENT OF 1999 GDP)



cation of resources. Sometimes, this rush to tax competition transfers wealth abroad. Our research suggests that transparency and tax breaks are substitutes – that financial reform can make these tax concessions unnecessary.

Recent reform in Latin America and elsewhere in emerging markets has often been enacted according to the Brazilian expression, *para o Inglês ver*, "for the Anglos to see." This old saying must be updated; better still, it should be retired. Latin America and other emerging markets have the potential to become hosts for far greater amounts of foreign capital. More important yet, emerging markets can raise domestic investment, achieve greater financial sector depth, and create institutions and markets that will unlock the gates to economic development. M

ANSWERS TO THE PUZZLER, PAGE 87

"The American scholar faces taunts...for not meeting a payroll, for not coming down from the ivory tower, for not getting wet behind the ears of his smarty egg head. Come to think of it...if he's so gosh darn smart, why hasn't he gotten rich?" — D.N. McCloskey, *If You're so Smart.*

A. daffodils
B. natch
C. miffed
D. Chesterton
E. Christ
F. lighter than air
G. oompah
H. so tonight
I. kosher hot fry
J. entrench
K. yeti
L. ignorant sow
M. famed women
N. yams
O. Otho
P. urban
Q. rhinoceros
R. effect
S. stove
T. ohm
U. swagger
V. magnetron
W. athlete
X. rotations
Y. Twiggy

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Back by popular demand! Well, to be honest, my wife and kid missed the feature, and my creative juices were flowing this morning. And besides, we had all this extra space… Herewith, a heads-up on economic policy research you may not know about.

A TRILLION HERE, A TRILLION THERE

Federal budget forecasts are always wrong, and usually they are wrong by laughably large amounts. For example, between April and July of last year, the Congressional Budget Office "adjusted" its estimate of the 2001 surplus by $95 billion. And that was hardly a record. In 1982 and again in 1991, the CBO missed the actual deficit number by nearly 3 percent of GDP – almost twice the size of the 2001 error when measured in percentage terms.

No, explains Rudy Penner of the Urban Institute, the forecasters at CBO aren't dumb. Nor are they cynically manipulating their estimates to serve their benefactors in Congress. The job is simply harder than is generally understood. Penner should know; he served as CBO director from 1983 to 1987.

Penner assays the CBO forecasting process, explaining among other things, how past errors in forecasting affect future errors. Equally important, he ruminates on the question of how policymakers should use forecasts they know will be wrong – and how the Congressional Budget Office should package its results to minimize the consequences of error.

The big lesson, he argues, is that the longer the forecast, the less credence should be placed on the numbers. Thus, the second five years of a 10-year forecast should be labeled with appropriate warnings. And the CBO should resist the temptation to publicize cumulative values for the surplus/deficit – if the forecast is a little bit wrong in the first few years, the cumulate estimate for the remaining years is likely to be a lot wrong. [*"Errors in Budget Forecasting," Urban Institute Research Report. For copies, e-mail paffairs@ui.urban.org.*]

HOW DO YOU SAY "YAHOO" IN UZBEK?

You've heard about the digital divide in American education – the reality that middle-class kids are more likely to use and learn about information technology than their low-income peers. But are you ready for the digital divide on a global scale?

Actually, this is not a joking matter. Information technology can ease the problem of playing economic catch-up in poor countries – it is simpler, after all, to distribute computers with Internet connections than it is to build schools and factories. But making the transition to an economy driven by information technology requires the

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sort of business flexibility that is hard to come by in many benighted lands.

George Clarke, an economist in the World Bank's Development Research Group, surveyed 3,000 enterprises in 21 formerly communist countries ranging from Albania to Uzbekistan. In Azerbaijan, fewer than 8 percent were linked to the Internet, compared to 84 percent in Slovenia. Most striking, he found that companies that were wholly or partly owned by foreigners were twice as likely to be linked to the Web. Yet again, evidence that foreign direct investment is good for children and other living things. [*"Bridging the Digital Divide," World Bank Working Paper 2629. Download from econ.worldbank.org/view.php?type=5&id=2239.*]

Crime and Procreation

Why did the crime rate collapse virtually everywhere in the United States in the 1990s? Standard explanations include the high rate of incarceration, the decline in the use of crack cocaine, and the reduced tolerance for aberrant behavior on the part of local police. John Donohue of the Stanford University Law School and Steven Levitt of the University of Chicago offer a very provocative alternative: the availability of legal abortion.

The theory is simple enough. Unwanted pregnancies that come to term produce unwanted children. And unwanted children are far more likely to become criminals.

To test the theory, Donohue and Levitt compare crime trends in the five states that legalized abortion in 1970 to trends in the rest of the nation, where abortion was only legal in the wake of Roe v. Wade in 1973. All five states experienced declines in crime earlier. What's more, states that had high rates of abortion in the 1970s and 1980s, enjoyed sharper declines in the 1990s. On balance, the two economists estimate, fully half of the decade's decline in crime is associated with legalized abortion. [*"The Impact of Legalized Abortion," Quarterly Journal of Economics, May 2001.*]

BEAM ME UP, SCOTTY

Economists are of two minds about the very idea there is a New Economy – that information technology has fundamentally altered production processes and increased opportunities for productivity growth. On the one hand, the possibility of a New Economy makes things more interesting, forcing a reconsideration of policies affecting everything from antitrust to education. On the other, claims that the world has changed make economists suspicious. Economics is a profoundly conservative profession, whose practitioners are invested in the notion that simple and enduring models of behavior have the power to explain the world around them.

Grudgingly, though, the New Economy is making converts from the ranks of the well informed. The latest are Martin Neal Baily and Robert Z. Lawrence, recently departed from the President's Council of Economic Advisers. They find that, notwithstanding the dot-com bust, there has been a surge in productivity growth linked to investment in information technology. In particular, retail and wholesale trade – industries most directly affected by the rise of the Internet – have increased their productivity growth by four percentage points since 1995. [*"Do We have a New E-conomy," American Economic Review, May 2001.*] — *Peter Passell*

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BEST PLACES FOR BUSINESS

What is the best city in the U.S. to do business or to advance a career? According to the third annual Forbes-Milken Institute Best Places ranking, it's San Jose. The ranking, published in the May 28 issue of *Forbes* magazine, measures wage and salary growth, job growth and high-tech output growth, among other criteria.

This is the third year that economists in the Institute's Regional and Demographic Studies group have partnered with *Forbes* to create the rankings. The rest of the top 10: Austin, San Francisco, Boulder, Dallas, Santa Rosa (CA), Boise, San Diego, Phoenix and Oakland. For the complete rankings, visit the Milken Institute Web site (www.milkeninstitute.org).

ENTERPRISE IN ISRAEL

As part of its efforts to encourage economic reform in Israel, the Milken Institute cosponsored two conferences in that country in June. The first, "Privatization in Local Government: Models and Lessons," was held June 13-14 in the city of Ashkelon. The second, "Private/Public Partnership Strategies for Urban Economic Development," was held June 14 at Tel-Aviv University.

Glenn Yago, director of capital studies at the Milken Institute, said these two meetings showed that, despite the ongoing violence in that part of the world, serious work on improving the Israeli economy continues. "Israel and its neighbors need strong economic foundations if they are to build stable societies," explained Yago. "These conferences continue the valuable discussions we've been having with Israeli leaders on how to create more efficient capital-market mechanisms to meet the goals of urban development."

HOLLYWOOD STRIKES AGAIN

According to a Milken Institute study, the movie and television industry has become such an integral part of the Los Angeles economy that a strike by Hollywood writers and actors would have cost the region as many as 81,000 jobs and $6.9 billion in income.

The report, commissioned by the Office of Los Angeles Mayor Richard J. Riordan and written by the Milken Institute and Sebago Associates, was released before the contracts between the studios, and the writers and actors, expired. For details, go to www.milkeninstitute.org.

MILKEN INSTITUTE AWARD WINNERS

Seven academics have received the annual Milken Institute Award for Distinguished Economic Research, an annual competition honoring outstanding papers by scholars from outside the Institute. This year's winners:

- David H. Autor, assistant professor, MIT Department of Economics: "The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcings."
- Ross Levine, director, Finance Department, Carlson School of Management, University of Minnesota: "Bank-based or Market-

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based Financial Systems: Which is Better?"

- Theodore M. Barnhill, Jr., chairman, Department of Finance, The George Washington University, Panagiotis Papapanagiotou, senior fellow, The George Washington University and Liliana Schumacher, senior economist, International Monetary Fund: "Measuring Integrated Market and Credit Risk in Bank Portfolios: An Application to a Set of Hypothetical Banks Operating in South Africa."
- Barry R. Chiswick, Department of Economics, University of Illinois (Chicago), and Paul W. Miller, Department of Economics, University of Western Australia: "Do Enclaves Matter in Immigrant Adjustment?"

To download copies, go to the "What's New" page of the Milken Institute Web site (www.milkeninstitute.org) and look under "New Publications."

NEW BOOK SERIES

The Milken Institute and Kluwer Academic Publishers have announced a new book series that focuses on the Institute's core issues of financial innovation and economic growth. Three books have been completed and will be available soon:

- *Restructuring Regulation and Financial Institutions*, James R. Barth, R. Dan Brumbaugh, Jr. and Glenn Yago (editors).
- *Mergers and Efficiency: Changes Across Time* by Susanne Trimbath.
- *Financial and Economic Reforms in Emerging Markets: The Decade of Transition*, by Thomas Hall.

Additional books in the series will focus on emerging markets in the United States, the savings and loan crisis, environmental finance, antitrust, global finance and technology's role in promoting regional growth. For more information, contact the Milken Institute or Kluwer Academic Publishers (kluwer @wkap.com).

New Publications

- ***Knowledge-Value Cities in the Digital Age*, by Ross DeVol and Joel Kotkin.**
- ***2001 Milken Institute Global Conference Briefing Book*, by the Institute staff.**
- ***Is Indonesia Reinventing Itself?* by Hilton Root.**
- ***Innovating Environmental Finance*, by Ricardo Bayon.**
- ***Financing Global Environmental Futures: Using Financial Markets and Instruments to Advance Environmental Goals*, by Glenn Yago.**
- ***Russia's Defense Enterprises: Between the State and the Market*, by Michael Intriligator, Leonid Ya. Kosals and Rozalina Ryvkina.**
- ***The Contribution of Unjust Dismissal Doctrine to the Growth of Employment Outsourcing*, by David Autor.**
- ***Capital Access Index: Financial Repression and Capital Access*, by Glenn Yago, Thomas Hall, Susanne Trimbath and Juan Montoya.**

Publications can be ordered through the Institute's Web site or by phone (310-998-2600).

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Want to keep up with all of the events, publications, research and other news from the Milken Institute? (Things do happen between quarterly issues of the Milken Institute Review.) It's easy. Just give us your e-mail and tell us what you're interested in. Go to the Institute's Web site (www.milkeninstitute.org), click the "Join Us" button in the upper-right-hand corner, and fill out the form.

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OUR PRESIDENT IS TRYING TO TEACH US SOMETHING.
THE FEDERAL SURPLUS ISN'T THE GOVERNMENT'S MONEY. IT'S YOUR MONEY!
WHY ARE WE SO SLOW TO UNDERSTAND THIS? IS IT A MATTER OF SELF-HATRED? ARE WE AFRAID TO ENJOY WHAT'S RIGHTFULLY OURS?
BUT, MR. PRESIDENT, WHAT ABOUT THE FEDERAL DEBT? AREN'T WE RESPONSIBLE FOR THAT?
DON'T BE RIDICULOUS! WHY SHOULD THE PEOPLE BE RESPONSIBLE FOR MONEY THAT THE GOVERNMENT WASTED?!
BUT ISN'T OUR GOVERNMENT SUPPOSED TO BE " OF THE PEOPLE, BY THE PEOPLE AND FOR THE PEOPLE"?
EXACTLY! MY TAX CUT IS FOR THE PEOPLE!
BUT WHAT ABOUT THE 5.2 TRILLION DOLLARS WE STILL OWE, MOST OF WHICH RESULTED FROM THE 1981 TAX CUT AND DEFENSE BUILD-UP? SHOULDN'T THE RICH PEOPLE WHO RECEIVED THE BULK OF THAT TAX CUT BE SENT THE BILL FOR THE DEBT WE HAVEN'T YET PAID OFF?
YOU'VE GOTTA BE KIDDING! THOSE ARE THE PEOPLE WHO GENERATED THE GROWTH OF THE EIGHTIES. THAT'S WHY WE NEED TO REWARD THEM!
YOU SEEM TO TREAT THE FEDERAL DEBT AS IF IT'S NOT IMPORTANT.
IT'S NOT!
BUT WHAT ABOUT THE PEOPLE WHO CAN'T AFFORD PRESCRIPTION DRUGS OR PRESCHOOL EDUCATION?
I DON'T KNOW ANYONE WHO CAN'T AFFORD THOSE THINGS!
BUT WHAT ABOUT YOUR MISSILE DEFENSE SHIELD? WON'T THE COST OF THAT, PLUS YOUR TAX CUT, PLUS THE COMING ENTITLEMENT CRUNCH BRING ANOTHER TITANIC WAVE OF DEFICITS JUST LIKE THE TAX CUT DID IN THE EIGHTIES?
THERE YOU GO AGAIN! FUZZY MATH!
HA-HA-HA
BUT... BUT...
HA-HA-HA
LISTEN, FELLA, YOU'RE O.K. REALLY. HERE'S YOUR 300-DOLLAR TAX CUT. GO HAVE SOME FUN!
HE'S ANSWERED EVERY ONE OF YOUR QUESTIONS. WHAT MORE DO YOU WANT?

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In this issue

TIM FERGUSON
On Santa Monica's growing pains.
The Car triumphs again.

MICHAEL BERNICK
On job mobility.
Chump change isn't enough.

JOSH LERNER
On the rewards to high-risk investment.
The New Economy is a whole new game.

EDWARD WOLFF
On who got what in the 80s and 90s.
The money done gone.

WILLIAM GALE, SAMARA POTTER AND EMILY TANG
On the Bush tax cut.
This turkey won't fly.

LOUIS GUTH AND MICHAEL SHAGAN
On the regulation of thoroughbred racing.
Let my ponies go.

MARSHA VANDE BERG
On Asian software competition.
China inches up on India.

GLENN YAGO AND THOMAS HALL
On capital market opacity.
The more you see, the more you get.

A cartoon strip by
MARK ALAN STAMATY,
creator of *The Washingtoon.*

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